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AERONAUTICS

THE AMERICAN MAGAZINE
OF AERIAL LOCOMOTION

VOL. 7
NO. 1.

JULY, 1910

25
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acts About "Elbridge" Engines

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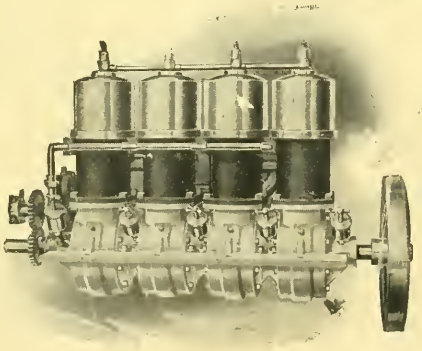

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Elbridge rating, 40 h. p. A. L. A. M. rating 60 h. p. Weight 167 lbs.
Also made in 2 cyl. 20 h. p.; 3 cyl. 30 h. p.; 6 cyl. 60 h. p..
Air-cooled engines, 1 to 4 cyl. 5-20 h. p. at 1,000.

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...1910...

First five winning cars in tour
Ninety-five (95) out of a total of 127 entrants
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Victories for

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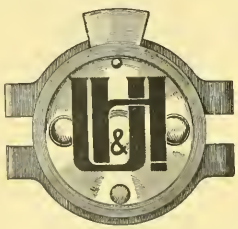

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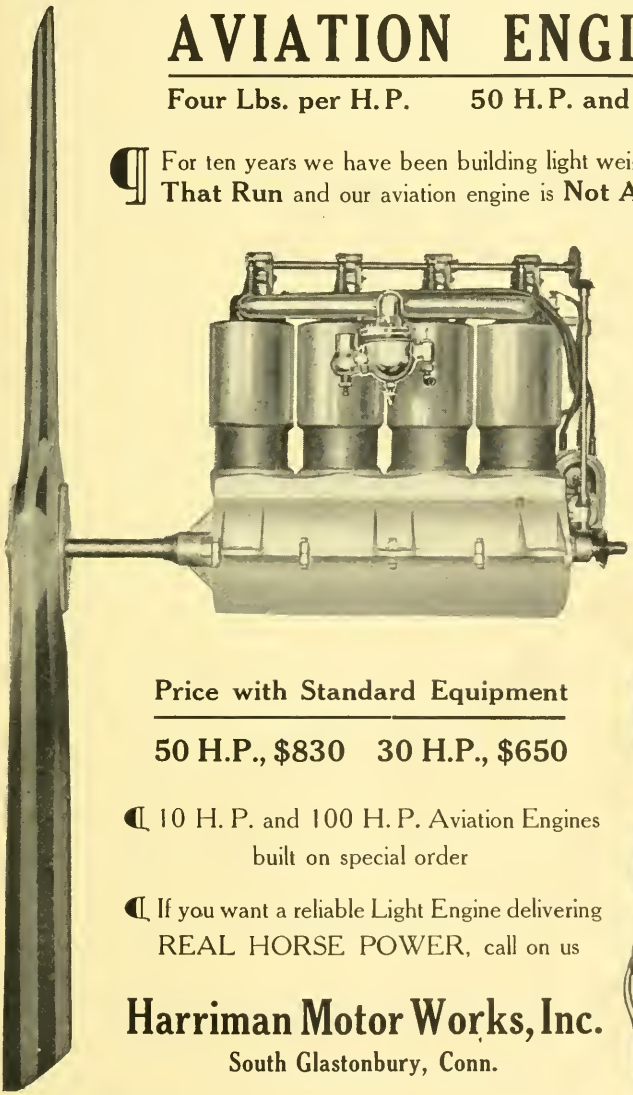

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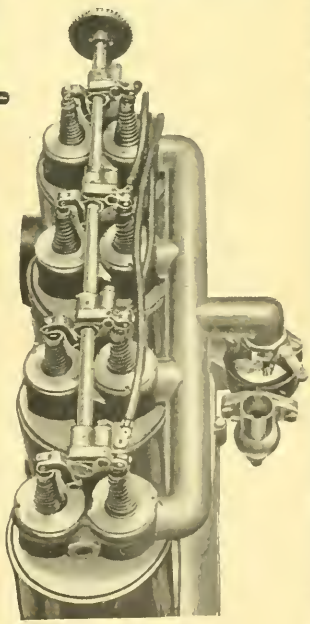

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50 H.P., $830 30 H.P., $650

¶ 10 H. P. and 100 H. P. Aviation Engines built on special order

¶ If you want a reliable Light Engine delivering REAL HORSE POWER, call on us

Harriman Motor Works, Inc.

South Glastonbury, Conn.

June 2, 1910.

El Arco Radiator Co.,

Gentlemen:

I am pleased to report that the El Arco radiator used by me in the flight from Albany to New York has given the very best of satisfaction and cooled the engine perfectly, without any apparent loss of water during the flight. Your construction, without doubt, gives the greatest efficiency at a minimum weight.

Yours truly,

G. W. Curtiss

The EL ARCO RADIATOR COMPANY'S Factory is at 6-8-10 East 31st Street, New York. Stock radiators on hand; specials built in five days; also lightweight tanks, and—of course—automobile radiators.

In answering advertisements please mention this magazine.

TO THE PROMOTERS OF THE Coming Aeroplane Meets

YOU want exhibitions of Man-Lifting Aeroplane Kite Flying to interest the crowds while the aviators are not flying.

¶ High or even moderate winds will invariably keep the aeroplanists from flying until late each afternoon. Before then we will fill the air with hundreds of 9- and 12-foot Aeroplane Kites of every known kind. By flying these, dozens in tandem, enormous American flags, streamers and announcement banners about the meet can be lifted a half mile in the air.

¶ These scientific kites will fly all day and the displays will be a great attraction in themselves and will keep the crowds quiet and contented, when for any reason the aeroplanes cannot fly.

¶ At the Meet of the West Hudson Aero Club at Arlington, N. J., June, 1909, New York papers said, "The hundreds of kites in the air were a decided feature."

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¶ I am a SPECIALIST in the model-making art.

¶ It is my business to duplicate in miniature any apparatus of any kind from the large machine or from scale drawings, accurate to the 100th part of an inch.

¶ Models made for the Patent Office.

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Glenn Curtiss Flies from Albany to New York City

In a Bi-plane Equipped with PALMER AEROPLANE TIRES

(See page 7 for an account of the flight)

The B. F. Goodrich Company, Akron, Ohio

Hammondsport, N. Y., June 4, 1910

Gentlemen:—I have your letter of June 1st and thank you for your complimentary expressions.

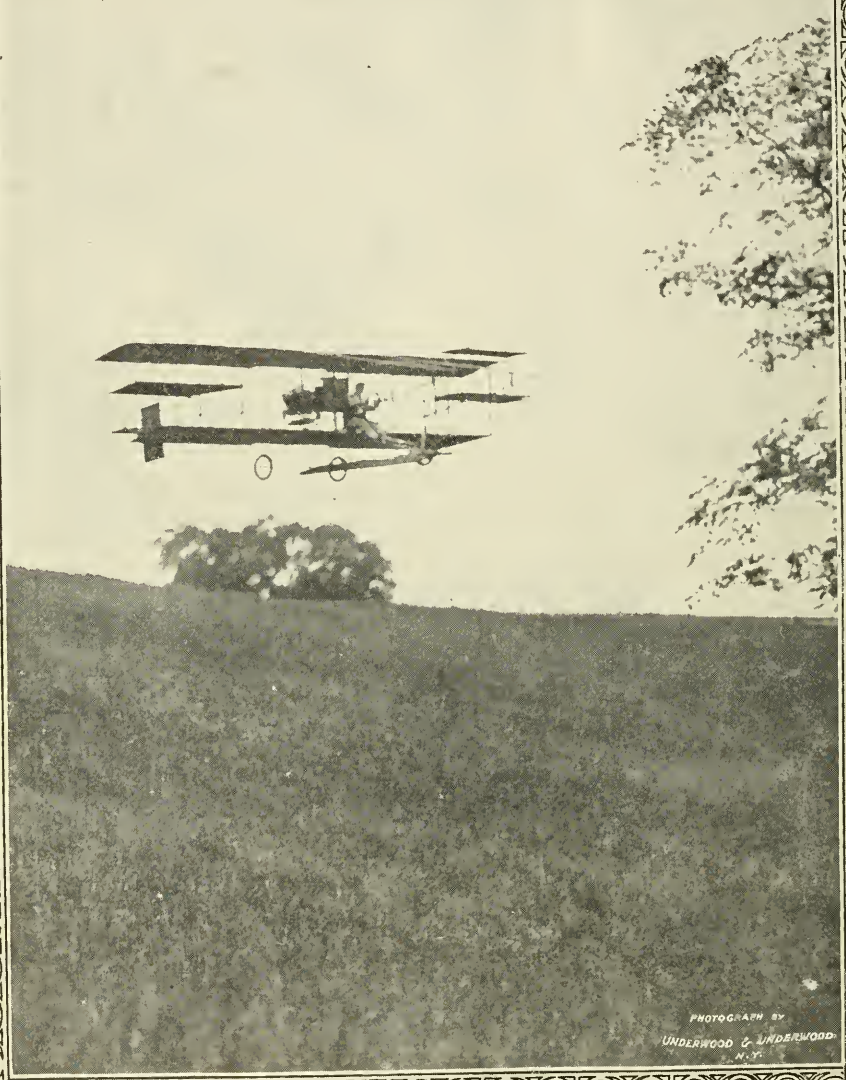
The Palmer Tires, with which I equip all of my aeroplanes give the best of satisfaction for the purpose. The light weight does not greatly impede the lifting power of the machine and the great resiliency enables me to land without shock on the hardest ground and to pick up speed quickly in starting. I am glad to credit a part of the success of my aeroplane to the Palmer tire.

Yours very truly,
(Signed) G. H. Curtiss

The Palmer Aeroplane Tire

Manufactured by

The B. F. Goodrich Company :: :: Akron, Ohio



GLENN CURTISS AT INWOOD-
ALBANY TO NEW YORK FLIGHT
HE USED A BOSCH MAGNETO

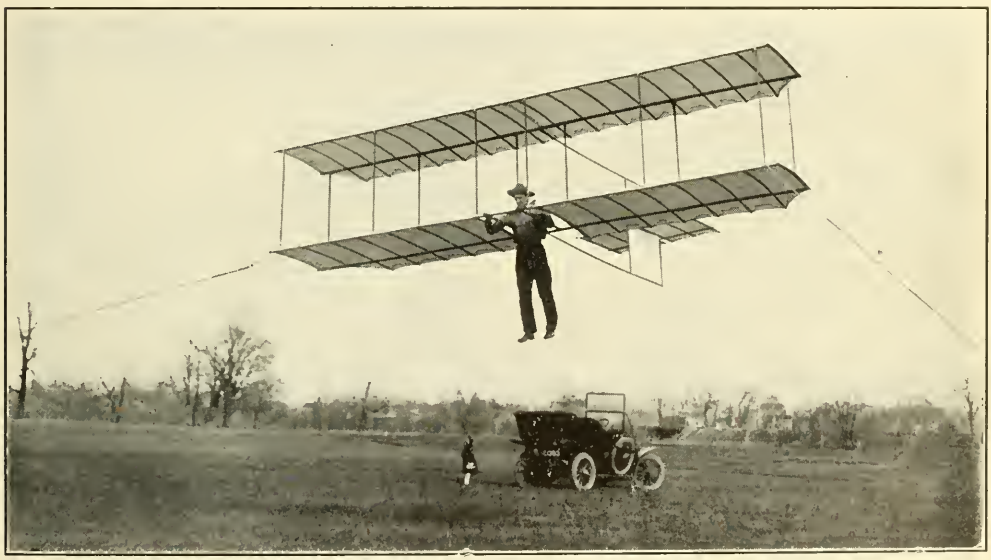
Aeronautics

Gliding as a Sport

By Hiram Percy Maxim

MY object in undertaking aeronautical experiments has been purely from the standpoint of sport. In this I must say that I have not been disappointed. I and my friends have certainly found in it more outdoor sport and interest than in anything else I have attempted in the past. Up to the time I sprained my ankle by a foolish attempt to beat a previous record, I made flights several times a week, or whenever the breeze was fair.

There is not the slightest doubt that "flying" is the great coming sport. From my experience I believe that the younger class of people who enjoy outdoor life will buy gliders and motor planes, and arrangements will be made so that the machines can be kept and used at the country clubs and the golf clubs, to one of which most of us now belong. At these country and golf clubs there is most always a corps of servants to look after a machine, and do the necessary repairing and refitting. In addition, these clubs always have splendid grounds upon which to practice flying. There are always hills for gliding, and in most cases there are large areas free from trees and similar obstructions. A great advantage is that in clubs of this nature the general public would not have access, and one would be able to begin his practice, which is always very clumsy, without having the invariable "gallery" of hangers-on, which is unavoidable at any public field.



The illustration shows my Wittemann glider, which is really a very superb piece of work, being towed by a man against a breeze which probably was about fifteen miles per hour. Towed in this manner, the machine rises beautifully. It is absolutely steady, and when one gets thirty or forty feet above the ground there is usually found enough wind to keep one aloft without the tow having to advance.

After becoming acquainted with the machine and the balancing and controlling, the tow lines are left off, and flights are made by running with the machine down a hill against the wind. After running about ten or fifteen feet a lift on the front of the machine carries one straight up into the air, and it is possible to coast down to and beyond the bottom of the hill, very similar to one coasting down a hill on a toboggan in the winter time. The greater the skill and the better the breeze the farther the coast. Indeed, I am wondering if with enough skill and breeze it would not be possible to actually keep aloft indefinitely. If this were possible it certainly would open up great things.

The accident which I was unfortunate enough to suffer was due to carelessness on my own part. For the benefit of those who may also be so intoxicated by this most fascinating of all sports as to act foolishly, my experience may be worth noting;

I had made several very successful flights, being towed by an automobile against a breeze which did not amount to more than five or six miles per hour. Just at sundown I decided to make a new form of bridle hitch, and by the time I had completed it it had grown quite dark and the wind had fallen just short of a flat calm. Of course, it was no time to attempt to glide, and had it not been for the enthusiasm which this sport arouses I would have stopped. I told the driver of the automobile to give me as near 20 miles an hour as he could judge in the dark. At the rear of the automobile we had fastened a 15-ft. length of 2-in. by 4-in. spruce. From the ends of this two tow lines were run, one to each end of the glider. After starting I rose quickly to about 50 ft., and in the excitement the driver of the automobile veered slightly from the true course. This meant considerable variation at the ends of the 15-ft. timber at the back of the car. The result was that my starboard tow line became very taut, while my port line became slacked. This pulling on one side immediately tipped the glider up. I corrected this, but in the swinging sideways, due to the elevation, it suddenly brought the taut line to the other side. This gave me a sudden reversal of the dip, which was of such terrific magnitude that I could not begin to control it. The result was that the planes actually tipped up until they were standing straight up and down in the air. The machine then, of course, dove sidewise, and the result was a sprained ankle, knee and hip joint for the too enthusiastic writer.

The moral is not to attempt these things unless it is light enough for the automobile to hold a straight course, and also unless there is a little breeze. In the free flights down hill there is practically no danger of accident to anyone having ordinary dexterity.

Can a Man Fly With Wings?

By H. La V. Twining

[*Continued from the June Number*]

President Aero Club of California; Head of Physics and Electrical Engineering in the Los Angeles Polytechnic High School; Author of "Wireless Telegraphy," Etc.

A superficial observation of the bird brings out the following facts: The wing is attached by its front edge forward and above the center of gravity of the body of the bird; and the center of gravity of the body and the center of figure of the two wings are situated in nearly the same vertical plane. This relation is fundamental.

The pectoral muscles that lower the wing are attached to the front edge of the wing near the body, and the elevator muscles are found underneath the large pectoral muscles. They send a tendon up around the hinged joint between the wing and shoulder. This tendon attaches to the upper front edge of the wing, nearer the joint than does the lower muscle. The remarkable fact to be noticed is that the elevator muscles are very small and weak compared with the depressor muscles. The muscles that elevate and depress the wing therefore oppose one another. This makes a lever of the third class of the wing, whereby power is converted into speed, forming a lever similar to the arm, at the elbow.

In Fig. 1, let A be the body of the bird, B the large pectoral muscle, D the hinge joint, and E the elevator muscle. In this lever, for striking the air D is the fulcrum, E and B the power, while C is the long arm to receive a long and swift sweep. Consequently, a short and powerful contraction of the muscle B resulting in a small movement at O throws the end of the wing C, through a long distance quickly. Since the reaction of the air upon the wing C is proportional to the square of the speed with which it is driven, we can see at once the advantage of this arrangement. Here is a factor that makes the length of the wing much more effective than its width. In fact the wing must be narrow and long in order to develop the greatest reaction, and it is not a mere matter of the relation between square surface and weight with which we have to deal. The less the surface and the shorter the wing, the greater the speed with which it must be driven in order to develop the same reaction. The wider the wing and the shorter it is, the square surface remaining the same, the faster it must be driven in order to develop the same lift. The longer the wing, the slower it can be driven in order to develop the same lift. In fact, its speed will vary inversely as the square of its length and

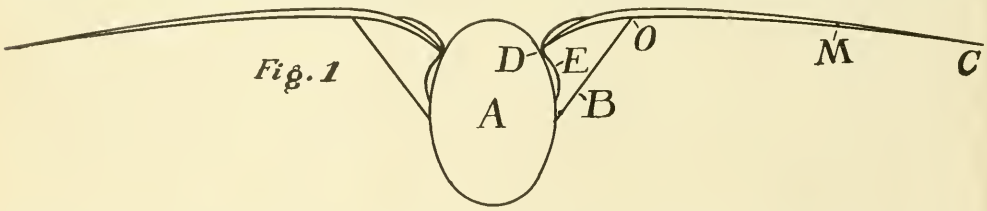


Fig. 1

inversely as its width. It is readily seen that it is the outer end of the wing that really does the work. In fact, the inner part of the wing can be entirely cut away, and it will remain just about as effective. Either in soaring or in flapping flight, it is the end of the wing that is the most effective.

The next feature to be noted is this: In order to obtain support a 10-lb. turkey must develop 5 lbs. reaction under each wing.

We shall suppose that this 5 lbs. reaction to exist at the center of pressure which we shall suppose to be two-thirds of the way out towards the tip, at least. Since the pressure increases with the square of the distance from the center of motion, this is very nearly true. The turkey that I mentioned before has a wing spread of 5 ft., with an area of 3 sq. ft., and an average width of 7½ in. This would locate the center of pressure about 20 in. out from the shoulder. The pectoral muscle that depresses the wing is attached about 1½ in. from the shoulder. Here an important point presents itself. In a lever, the power times the power distance equals the weight times the weight distance. In Fig. 1, if we regard the power applied at O as represented by X, D being the fulcrum, the power distance is OD. The reaction, which is equivalent to the weight, is at M and hence MD is the weight distance. OD is 1½ in., MD is 20 in. and the reaction at M is 5 lbs., hence (X) (1½) equals (20) (5). Solving X, equals 66⅔ lbs.

If the above analysis be correct, then the turkey must pull with a force of 66⅔ lbs. on each wing in order to fly, if it is continuously to support its weight. That is to say the turkey must maintain a pull of 133⅓ lbs., while flying or soaring, provided it is continually supporting its weight.

This means the expenditure of .24 h. p. in order to rise 1 ft. in 1 sec. or .12 of a h. p. to rise 6 in. per sec.

This is preposterous. A man's rate of work is about .1 h. p. If a man climbs a mountain, rising at the rate of a foot per second he has to be a hustler. This requires .27 h. p. In fact to go upstairs at that rate will take the breath out of an ordinary man. If he climbs at the rate of 6 in. per sec. he will be doing pretty well. This is .13 h. p. A 10-lb. turkey is not very fond of flying. A turkey buzzard, however, weighing 4 lbs. and having a wing expanse of 3 ft. and an average width of 8 in. flies and soars with ease. Each wing is 1½ ft. long. This gives an area of 1 sq. ft. per wing, or 2 sq. ft.

In this wing then we have: (X) (1) equals (2) (12); the pectoral muscle attaches 1 in. from the shoulder; and ⅔ of 18 in. is 12 in.; a 2-lb. reaction is necessary at M. Consequently X equals 24. Hence the buzzard must pull 24 lbs. on each wing or 48 lbs. in all. This gives the turkey buzzard about .1 h. p. to rise 1 ft. per sec., whether soaring or flying.

An ordinary man weighs 37½ times as much as the turkey buzzard, and if the buzzard is expending energy at the same rate that a man expends energy, then it has to burn as much fuel as a man in a stove 1/37 as large. This does not look good to a reasonable mind, and there must be some mistake in it.

If, on the other hand, the fulcrum is not at D, Fig. 1, after the resistance of 2 lbs. is developed at M, but at M instead, then we have an entirely different proposition. In a lever the fulcrum is at the point of support when the weight is lifted. When the bird is lifted by the reaction of the air, it is resting on the center of pressure of the wing. Hence the fulcrum ought to be found at that point. If this supposition be true, then the weight arm and the power arm are very nearly equal. MD is the weight arm and MO is the power arm. Then (20) (5) equals (18.5) (X) whence X equals very nearly 5.4, in the case of the turkey. In the case of the buzzard X equals 2.18 lbs.

This shows that a bird in flying has to lift practically its own weight only. This looks more reasonable. This represents .02 h. p. for the turkey and .008 h. p. for the buzzard in rising 1 ft. per sec.

There are losses to be taken into account here, of course, that would increase this.

But the question is, is the fulcrum really out at the center of pressure on the wing? Experiment only can determine it, although to suppose otherwise does violence to the judgment.

In a recent experiment results were obtained, which point clearly to the conclusion that the fulcrum is really out at the center of pressure.

EXPERIMENTS WITH MACHINE.

Last summer I constructed a machine built on the principles of bird flight as I see it. The machine weighs about 100 lbs. My weight is 140 lbs., making 240 lbs. The wings are manually operated by levers, which attach to the front edge of the wings through links, giving a leverage of four to one. The links attach 3 in. from the shoulder of the machine. The point of attachment is thus located forward and above the center of gravity of the body and machine. The machine is mounted on three bicycle wheels. I had hoped to cause it to run along the ground when the wings were made to oscillate, and after getting up a speed of 8 or 10 miles per hour on the ground, I hoped to be able to develop enough lift to take it off the ground. But nothing of the kind happened. I could beat the wings some 52 half beats per min., and develop enough reaction to take the wind out of me in about 10 sec. The wings had 30 sq. ft. each of surface and were some 10 ft. long by 4 ft. wide at the widest part. It took only a one pound and a half pull to move the machine along the ground with myself in it.

We suspended the machine by a block and pulley attached to a spring balance, and with myself in it, it weighed 240 lbs. By beating the wings down the machine rose 2 in. and gave

a 120-lb. lift on the scale. On the up stroke the machine rose slightly and developed forward motion.

Now if the fulcrum is at the shoulder we have the following: OD, Fig. 1, is 3 in., DM is 80 in., hence (3) (X) equals (120) (80) or X equals 3,200 lbs. That is it would take a pull of 3,200 lbs. at O to develop a reaction of 120 lbs. at M on both wings in order to lift the machine. It would take one-half of 3,200 lbs. or 1,600 lbs. to develop 60 lbs. at M in order to lift half of the weight.

As a matter of fact I was lifting half of the machine by making a 200-lb. pull at O. If the fulcrum were at D, I should have been able to have developed only a 9-lb. lift instead of 200 lbs. lift.

By an 18-in. motion between the hands and feet, the tip of the wings can be swung through 10 ft. The above results seem to indicate that the fulcrum is out on the wing, and if that is the case, there is no reason why flight with wings should be impossible.

There are other factors though that might favor or prove unfavorable to the above conclusion. If the wing is wasteful of power, or if the power is applied in a very disadvantageous manner, it might still be impossible.

[To be continued]

New Prizes

Curtiss' Flight Gets New Prizes.

The Albany-New York flight of Curtiss immediately had its effect on prize giving. For the past two years newspapers have been asked to offer prizes, but they seemed very cold. Mr. Curtiss' flight seemed to work wonders over night.

World-Post-Dispatch $30,000.

At the Hotel Astor banquet the $30,000 prize of the New York *World* and the St. Louis *Post-Dispatch* for a flight from New York to St. Louis, was made public. Conditions have not yet been named, as the prize will, it is expected, be awarded under the rules to be formulated by the national federation at its convention on June 22.

N. Y. Times-Chicago Post Prize.

Another big prize of $25,000 was announced at the Astor dinner by the New York *Times* in conjunction with the Chicago *Evening Post*, for a flight between Chicago and New York, about 960 miles. Other prizes will undoubtedly be offered by cities along the route. Conditions for this also will wait for the national federation which, no doubt, will in the future control all events in this country of local or national character.

Missouri Raising $10,000 Prize.

Only a few thousand dollars is needed to complete the prize of $10,000 which will be offered in July for a trans-state flight in Missouri, the start being St. Louis and the finish Kansas City. The prize will be open for competition the week of July 18, according to the present plan.

It is further planned to allow five stops at as many controls, if more than one entry is received and to start all at the same time on a day to be specified by an impartial committee, which will take weather conditions and the preparedness of the contestant into consideration. Three days will be allowed for the journey.

The course will probably be along the Wabash railroad to Kansas City, a distance of about 270 miles.

Edwin Gould Prize.

Edwin Gould ...as offered through the *Scientific American* a prize of $15,000 for the production of the best successful aeroplane equipped with two or more motors and two or more propellers, so that any power plant can be used either individually or in conjunction with the other or others. This prize is to stimulate the invention of a "safe" machine. The conditions will be announced later.

Evening World Trophy.

The Evening *World* has offered a perpetual challenge trophy in silver to the amateur making the longest continuous flight in any year. Each winner holds the cup for a year. The complete rules will be formulated and adopted at the national convention on June 22nd.

Scientific American $100 Prize.

The Scientific American offers $100 in three prizes to be awarded to the inventor who gives the best account of how he conceived his invention, how he developed it in actual practice and how he succeeded in getting it. This sum is divided $50, $35 and $15, open to August 15th, 1910. For rules address Scientific American, 361 Broadway, New York.

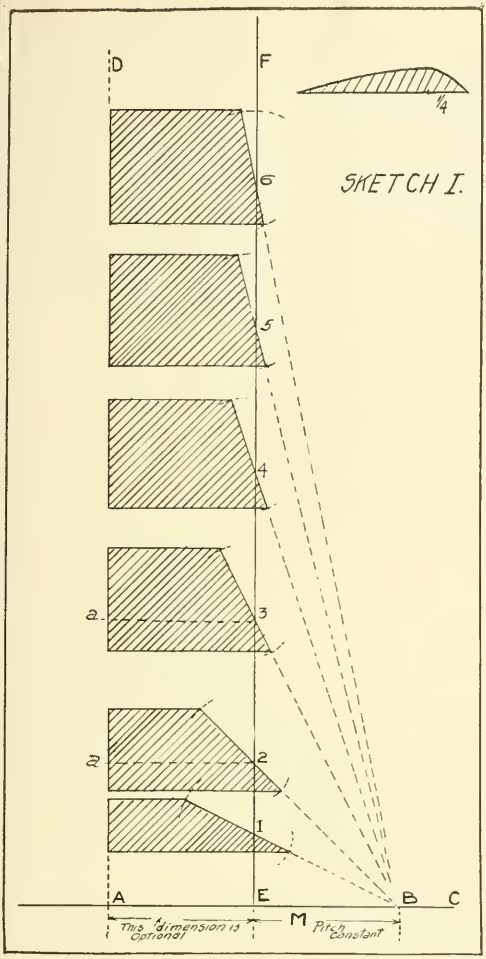
$20,000 for Race Between Wright and Curtiss.

The Aero Club of Washington has offered $20,000 to the Wrights for a flight from New York to Washington if they will enter one of their machines against a Curtiss.

J. P. Erie, of Denver, Colo., has been experimenting with a glider in which the upper surface is some 8 ft. greater in spread than the lower. This, he says, lends greater stability. There are triangular "wing tips" from the upper to the lower surface, at an angle of about 45 deg. from the horizontal.

First College Aero Degree.

The first degree to be awarded by an American University for work in Aeronautics was granted at the Columbia University commencement this June, when Grover C. Loening received the degree of Master of Arts. Loening's thesis, entitled "An Investigation of the Practice and Theory of Aviation," is about forty thousand words long, and is a complete study of the aeroplane, from practical as well as theoretical standpoints. Twenty-six large plates accompanying the thesis, and show details of the various successful aeroplanes.



SKETCH I.

How to Make a Propeller ::

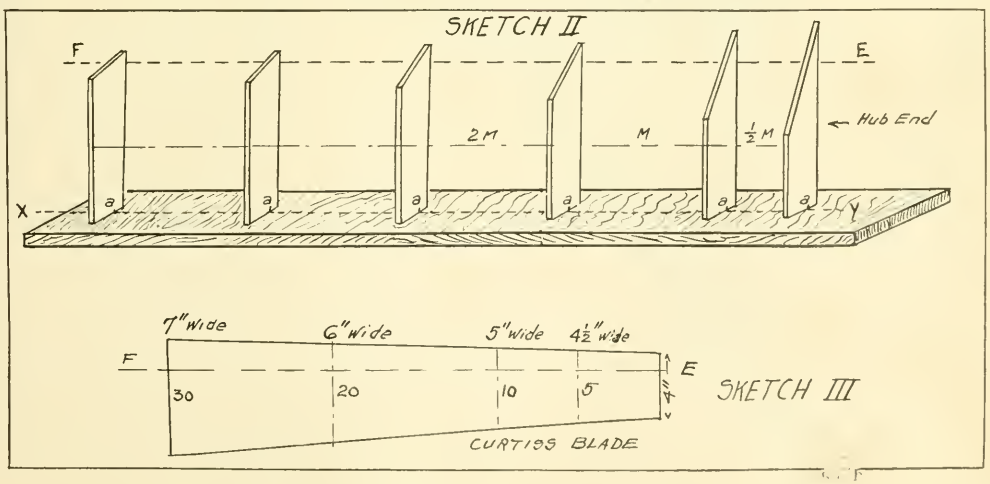
TO make a propeller templets for a uniform pitch propeller, using the Drzwiecki method, one follows the plan below, which has been adapted from the French of M. Drzwiecki's book. You can take the pitch and diameter you have figured out yourself, or take the diameter and pitch of such propellers as mentioned in AERONAUTICS.

First obtain the pitch constant M, i. e., Pitch divided by two times 3.14159265, or roughly, pitch divided by 6-2/7, or $\frac{P}{6}$ as it is near enough.

Having obtained your pitch constant M, lay it out on the horizontal line AC (sketch I). This will give you the distance EB. Draw a line EF perpendicular to AC from the point E. On this, starting from E, mark off lengths equal to ½M, M, 2M, 3M, 4M, 5M, giving you the points 1, 2, 3, 4, 5, 6. Lines are then drawn through these from the point B.

From these points 1, 2, 3, etc., with a radius equal to ¼ of the specific width of the blade. (This width is the width of the proposed propeller at *that point* and may be any width you choose.) arcs are drawn to intersect the lines 1B, 2B, etc., on the same side of the vertical line EF as the point B. Lines parallel to AC are then drawn through these points of intersection of the arcs with 1B, etc.

The same procedure is carried out on the other side of the vertical axis EF, with the same centers, but with a radius equal to ¾ of the specific width and lines parallel to AC are again drawn through the points where these arcs cut the lines 1B, 2B, etc.



The fourth sides of the templets are bounded by the vertical axis AD drawn perpendicular to AC at any optional distance from the point E. Drzwiecki used narrow blades about one-tenth of the diameter wide.

The templets thus obtained are cut out of thin pieces of wood and the points "a" are marked upon them at a distance of ¼ their width. The ¼ of width point "a" is measured from the front edge of the blade, i. e., the same side as axis EF is on and directly under the axis EF. This is where the thickest point of the blade comes, or the shank in a metal blade, and is near the front, to be at or in front of the center of pressure. (See sketch I.) These templets are numbered as in sketch I and fastened to a board with their plane perpendicular to the board. All the points "a" are placed on the axis "xy" in sketch II. These templets are spaced ½M, M, 2M, etc. The axis "xy" is directly under EF.

St. Louis Active in Ballooning.

Charles F. Wenneker, president of the Million Club, has placed an order with H. Eugene Honeywell for a balloon of racing size, which S. Louis Von Phul will pilot in the elimination race to select the American team of three balloons to represent the United States in the international balloon race, which will start from St. Louis, October 17. The elimination race will be held September 17 from Indianapolis.

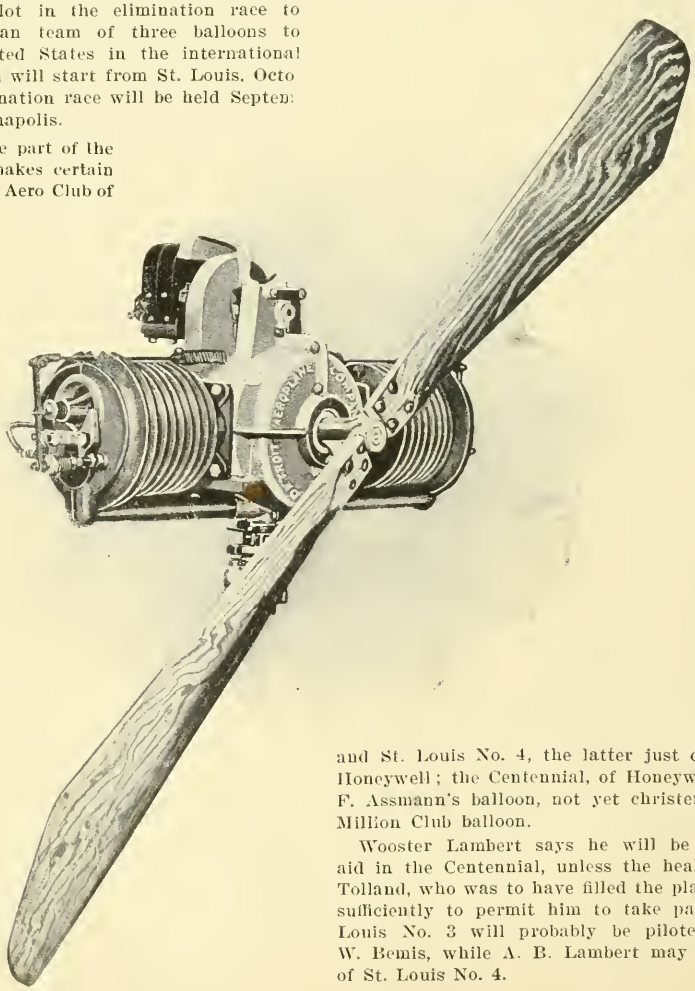
This action on the part of the Million Club now makes certain five entries from the Aero Club of St. Louis in the elimination race, and gives the club a chance to win all three places on the American team. It is not expected that any other club will enter more than three balloons in the elimination race.

These templets, of course, may be curved to form segments of a circle. It will be seen that the inclined edges of the templets form a guide to determine the shape of the blade of the propeller.

For illustration, take a Curtiss 6-ft. diam. and 5-ft. pitch propeller, 4 in. wide at hub, 7 in. at extremity. (Sketch III.) One blade is 3 ft. from the center of the hub. Draw a line 3 ft. long. Pitch is 60 in. One-sixth of 60 is 10 in. Lay off 10 in. on line EC. Then take distances, 5″=½M, 10″=M, etc. This gives only four templets, due to the fact that Curtiss' propeller is shorter than Drzwiecki's standard length. (According to Drzwiecki, a propeller with a 5-ft. pitch ought to be about 100 in. long.) This will duplicate, however, a Curtiss' propeller, as it is not of uniform pitch.

The balloons piloted by members of the St. Louis club will be the club aerostats, St. Louis No. 3 and St. Louis No. 4, the latter just completed by Honeywell; the Centennial, of Honeywell; William F. Assmann's balloon, not yet christened, and the Million Club balloon.

Wooster Lambert says he will be Honeywell's aid in the Centennial, unless the health of J. W. Tolland, who was to have filled the place, improves sufficiently to permit him to take part. The St. Louis No. 3 will probably be piloted by James W. Bemis, while A. B. Lambert may be the pilot of St. Louis No. 4.



New Engine of Detroit Aeroplane Company

COPY:

32 Grant Place,

Washington, D. C.

March 20, 1911.

Mr. Stanley Y. Beach,
361 Broadway,
New York.

Dear Sir:-

Your letter of the 18th did not reach me until this morning and the maps not until this afternoon.

From the cross marked on the island near Albany to the one marked near Camelot is 67.98 miles in a direct line at sea level and 71.56 miles down the center of the river as

rail road where a second cross has been marked on the map you have just sent me. If the upper point is correct the distances would be 0.31 of a mile more; 68.29 and 71.87 respectively.

The distance from Loredo to Eagle Pass, Texas, is 104.5 in a straight line and 106 miles by the river.

The distance from Antioch to Gorgona Id. is 138.46 miles.

Trusting the information is just what you wish, I am,

Yours very truly,

(Signed) Williams Welch.

Curtiss Wins :: $10,000 Prize ::

Flies From Albany to New York

THE FLIGHT IN FIGURES.

Distance, course, Albany to Camelot, 71¼ miles.

Distance, course, Albany to Spuyten Duyvil, 128 miles.

Distance, course, Albany to Governor's Island, 142½ miles.

Distance, straight line, Albany to Spuyten Duyvil, 122.8 miles.

Distance, straight line, Albany to Governor's Island, 136.34 miles.

Speed per hour, by path, Albany to Spuyten Duyvil 50.52 miles.

Total time in air, 2 hours, 50 minutes.

Elapsed time, Albany to Spuyten Duyvil 2 hours 32 minutes.

Gasoline used, 15 gallons. Oil used, 2 gallons.

Weight of machine, Curtiss aboard, with tanks filled, etc., about 1,000 pounds.

Distances compiled for AERONAUTICS by Mr. Williams Welch, Chief Draftsman, Office of the Chief Signal Officer, U. S. A.

Sunday, May 29. The Hudson-Fulton Celebration of last October was made complete only today when Glenn H. Curtiss, bearing a letter from the Mayor of Albany to the Mayor of New York, won the New York *World's* $10,000 prize for the first man to fly from Albany to New York, with an allowance of two stops on the way. Curtiss made but one stop within the conditions of the prize.

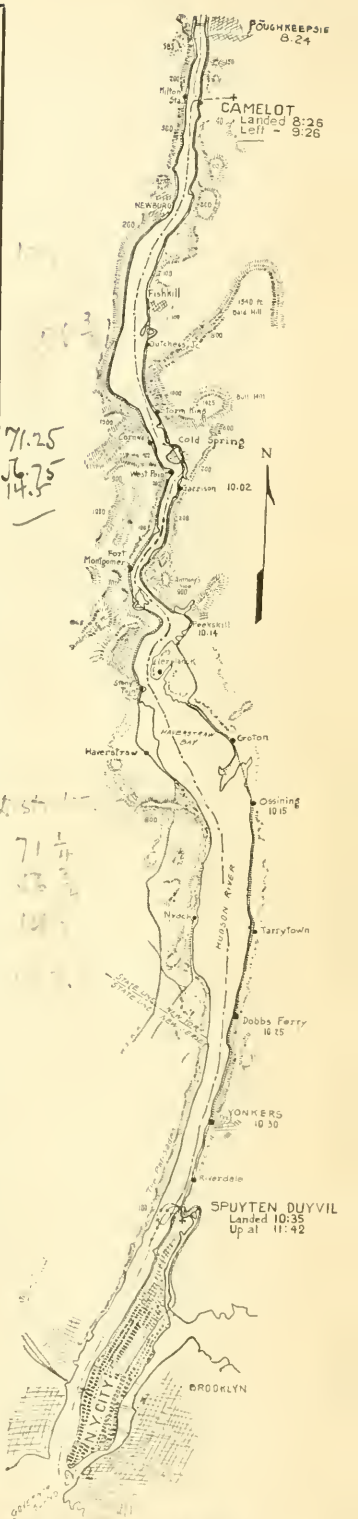
After waiting several days for favorable weather, the start was made from Van Rensselaer Island in the Hudson River, at Albany, at 7:02 a. m. Circling over the lower part of the city, a minute later he crossed the line and was on his way to New York.

At New Baltimore, a special New York Central train bearing Mrs. Curtiss, Mrs. J. S. Fanciulli, Augustus Post, the official observer; J. S. Fanciulli, Henry Kleckler, Mr. Curtiss' Chief Engineer; a committee from Curtiss' home town of Hammondsport and the newspaper men and photographers caught up with the aeroplane and kept pace with it as far as the first stop, near Poughkeepsie.

The New York Central Railroad runs close along the river as far as Spuyten Duyvil and the passengers could see practically every foot of Curtiss' flight.

FIRST LANDING AT POUGHKEEPSIE.

On down the Hudson without a skip of the engine, high over the Poughkeepsie Bridge he came, landing for gasoline and oil at Camelot, a few miles below Poughkeepsie at 8:26, after flying 71¼ miles in 83 minutes, a speed of 51.5 miles an hour. The machine was in perfect condition, save for one stay wire which vibrated too much. This was remedied. A farm had previously been selected here and a red flag hoisted to enable Curtiss to make out the place.



Curtiss Passing West Point *Pictorial News Co.*

At 9:26 Kleckler, who had come down on the special train, started the propeller and Curtiss was off again on the second half of his journey.

Passing through the Storm King Mountains, where the crew of the Hendrik Hudson are said to play at bowls on stormy nights, Curtiss met with his only difficulties in the way of air currents. Suddenly the air seemed to give way beneath the machine and it dropped like a plummet a few feet in the descending current.

"At Storm King," Mr. Curtiss told AERONAUTICS. "I was flying high through the narrow gap in the mountains and I caught the down current on one side more than on the other, and I dropped thirty or forty feet very suddenly and sideways. I had to shift the front control to get straightened out."

LANDS IN NEW YORK.

Making a wide detour toward the Jersey side of the river, he flew over the railroad bridge spanning Spuyten Duyvil Creek and landed at 10:35 on an open field on Manhattan Island. His oil tank was leaking and, though the conditions were fulfilled, he wanted to make the feat complete by continuing on to Governor's Island off the southern part of New York City, so he deemed it best to fill up with oil to make sure of the accomplishment. From Camelot to Spuyten Duyvil is 56¾ miles, time 69 minutes, or an average of 49.347 miles an hour, somewhat slower than the first half.

This field sloped steeply to the creek and there was no room to get a running start, so the machine was headed down the steep, grassy pitch and was in the air in record distance at 11:42. Out over the bridge again he went, between roughly wooded hills on either side and turned south down the Hudson, past Grant's tomb and over the plying excursion and ferry boats, the Statute of Liberty, to within a few feet of the shed which housed his machine on Governor's Island during the Hudson-Fulton celebration. The exact time was not taken here, but has been put at 12 noon. At 49.3 miles an hour it would just about take from 11.42 to 12 noon to cover the 14.5 miles.

As soon as the Curtiss party and the newspaper men could get to the battery they boarded the little government ferry which runs to Governor's Island. Mr. and Mrs. Curtiss embraced and were then congratulated by the few who were lucky enough to get by the guards at the ferry. The Hammondsport delegation and a committee from the Aeronautical Society were on hand to express their appreciation of the great feat. The Aero Club of America, under whose auspices the prize was donated, unfortunately neglected the formalities of such a momentous occasion.

The party went to the Astor for luncheon and then proceeded to the *World* office where the check for $10,000 was handed Mr. Curtiss with a few congratulatory words on his achievement.

TRIAL FLIGHTS.

Previous to this memorable flight, Curtiss made several long flights at Hammondsport over Lake Keuka, landing in the water, one of which lasted thirty-eight minutes.

Mr. Curtiss also entered for the Scientific American trophy, and the first half of his trip counts as a record for this event. Mr. Curtiss won the cup on the only two previous trials.

THE MACHINE.

Nearly four pounds to the square foot were carried in the flight, the upper plane having a

spread of 31 feet 3 inches, being extended 30 inches on each side. The lower plane measured 26 feet 3 inches. The front and rear horizontals were about three inches wider than usual. Flat rubber bags had been arranged below the outer extremities of the under planes, wooden strips being fastened to the front and rear lateral beams forming the chord of the surface and in between were the rubber air bags. Two cylindrical metal tanks were also attached under the lower surfaces on a line with the wheels, and the usual central skid had a wide board nailed to it on which was another rubber bag as shown in the photo. The two tanks were left behind at Spuyten Duyvil. Just in front of the front wheel, too, was a small curved surface to act as a hydroplane in case of landing in the water.

A Bosch magneto secured the efficiency of the spark and a special large El Arco radiator kept the 50 H. P. Curtiss 8 cylinder engine cool, and Vacuum oil did the lubricating. The wheels are fitted with Palmer tires and the planes are covered with Baldwin combination cloth.

PAULHAN'S FLIGHT COMPARED.

Paulhan took 4 hours 12 minutes elapsed time to cover 183 miles when he won the London Mail's $50,000 and made it in two stages of 117 and 66 miles each. The 117 miles were covered in 2:39, a rate of nearly 44 miles per hour. A night's sleep intervened and the remaining 66 miles were covered in 1:23, a rate of nearly 48 miles per hour. The average for the above was 44:37 miles per hour. Paulhan could have landed at almost any time and started again, whereas Curtiss could not have started if he had had to land in the water and for the whole distance there was scarcely a suitable space for landing on the ground, as for nearly the entire way rocky, wooded hills with precipitous sides line the river.

DINNERS TO CURTISS.

The following Tuesday evening a banquet was given by the *World* at the Hotel Astor to Mr. Curtiss, presided over by Mayor Gaynor, to which invitations were sent by the commonplace telegraph. Telegrams of congratulation from all over the world were read between courses. The speakers were: Mayor Gaynor, Hudson Maxim, president of the Aeronautical Society; Samuel H. Valentine, vice-president Aero Club of America; Don Seitz, of the *World*; Hon. James M. Beck, and Glenn Curtiss himself was prevailed upon to say a few words.

On June 7th the N. Y. Press Club gave a dinner to Curtiss. President John A. Hennessy presided and introduced the speakers with an abundant fund of humor. J. Bernard Walker, editor of the *Scientific American*, announced the Edwin Gould prize with appropriate remarks. William A. Johnston, of the N. Y. *World*, announced a trophy of the *Evening World* for amateurs; both proffers aroused great enthusiasm. The other speakers were: G. H. Curtiss, Charles M. Manly, Lieut. Humphreys, late of the U. S. A.; Lee S. Burridge, Clifford B. Harmon, William J. Hammer, and Rhinelander Waldo.

Just After Curtiss Landed at Governor's Island *Pictorial News Co.*

Hamilton Flies to Philadelphia

First Round Trip Between Cities.

SCHEDULE OF THE FLIGHT.

TO PHILADELPHIA.

	Distance.	Time.
Left Governors Island.....		7:43 A.M.
Landed at Philadelphia.	86.0	9:26 A.M.

RETURN FLIGHT.

Left Philadelphia		11:33 A.M.
Landed, South Amboy (after a detour).....	86.0	12.54 P.M.
Reascended, South Amboy	86.0	6:17 P.M.
Arrived at Governors Island.	86.0	6:40 P.M.

Time to Philadelphia, 1 hour, 43 minutes.
Philadelphia to South Amboy, 1 hr. 21 min.
South Amboy to Governors Island, 23 minutes.
Total distance, Phila. and return, 172 miles.
Total time in air, 3 hours, 27 minutes.
Average speed per hour to Phila., 50.09 miles.
Average hourly speed from Phila., 51.34 miles.
Airline distance, one way, 75 miles.
Average speed over straight line, 43.47 miles.
NOTE.—The distance by path is not exactly accurate.
Weight of machine with extra large oil and gas tanks, mounted, 950 pounds.
Surface main planes, 236 square feet.

"On June 13, Charles K. Hamilton flew from New York to Philadelphia and back in a Curtiss biplane in just a trifle over eleven hours. This is the first round trip between large cities and he kept a schedule which had previously been prepared very closely. His average from New York to Philadelphia and return was 50.72 miles per hour. On his trip over he made 50.09 and returning, 51.34. A special train on the Pennsylvania railroad followed him nearly the entire distance.

Hamilton made the first start from Governors Island at 7.11 A. M., but the propeller struck an obstruction, breaking one of the blades. Glenn H. Curtiss took the propeller from his Albany-New York machine, which fortunately was still housed on the island, and it was quickly put on Hamilton's 'plane, and he prepared for the second start, which was made at 7:36 A. M. He rose rapidly to a height of about two hundred feet and circled Governors Island, passing over his starting point and continued turning, until at 7:43 he actually started over New York Bay, out over the Statute of Liberty and straight for the high chimney of the Standard Oil Company at Bayonne. Heading then to the right over the Kill von Kull at a speed of about 45 miles per hour he flew straight over Elizabethport, where he came in sight of the special train which accompanied him over the tracks of the Pennsylvania railroad. He passed through Trenton at 8:49 and landed in Philadelphia at 9:26, just 1 hour and 43 minutes after starting.

Returning from Philadelphia the start was made at 11:33 A. M. and Trenton was passed at 12:09 P. M. Shortly after this point the motor began misfiring and he became confused by the railroad tracks of the Pennsylvania railroad and the Baltimore & Ohio railroad. Following the latter to South Amboy, he then decided to make a landing and seeing what he supposed to be a meadow on the shores of the Raritan River, he descended, but found the ground was a marsh. The spark plugs were changed and a new propeller sent from Governors Island was put on the machine to replace the one which he had which was broken in landing. The machine was carried from this wet ground, up the bank to a roadway, and a new start was made from this narrow place at 6:20 P. M. and Governors Island was reached at 6:40, a little over eleven hours from the time of eaving.

Bosch Magneto and Palmer tires won again. The radiator was an A-Z.

Other Flights in Curtiss Machines.

On June 7th to 9th, Willard and Mars were at Topeka, Kan. In flying over a railroad train, the aeroplane caught the suction from the last car and dropped to the ground, partially wrecking it. Mars was uninjured.

On June 12 at Springfield, Mo., Willard's engine failed him at a critical point, after making two good cross-country flights. In making a hasty descent Willard sustained cuts and bruises and the machine was almost totally wrecked.

J. C. Mars and C. F. Willard gave exhibitions at Joplin, Mo., May 28-31. Both Willard and Mars did well the first two days. Rain then intervened and "rain checks" were issued. On the 31st a new "stunt" was developed.

PROPELLER HIT BY BULLET.

Opening the program of the last day of flights, Charlie Willard launched out on a cross-country flight early in the afternoon. Straight across uneven country he flew until he disappeared across the crest of a line of hills. When he did not return after an hour's wait, J. C. Mars, the other aviator, set out to find him. Following the direction taken by Willard, Mars found him six miles from the aviation field, near Carl Junction, Mo. Mars landed nearby and discovered that Willard's propeller had been splintered by a rifle shot, from some person whose identity is unknown. Willard was at a height of 500 feet when the bullet struck his machine. He landed with considerable difficulty, barely escaping collision with a clump of trees. As soon as he discovered the nature of the accident Mars flew back to the aviation field, explained the circumstances and an automobile carried a new propeller to Willard, Mars returning to him through the air.

Willard's machine repaired, both aviators flew back to the aviation field and described figures in the air for an hour.

Hamilton finished his engagement at Atlanta, where he made his usual highly spectacular flights over the Speedway and during the auto races, on May 7th. The day before he made cross-country flight to Jonesboro, thirteen miles away, and return.

At Augusta, Ga., on the 11th of May he aroused an enormous crowd to a high pitch of enthusiasm. From there he went to Jacksonville, Fla., for May 21-22.

Willard flew in Alexandria, Va., May 14, for thirty minutes in a drizzling rain.

The Aviation :: :: World :: ::

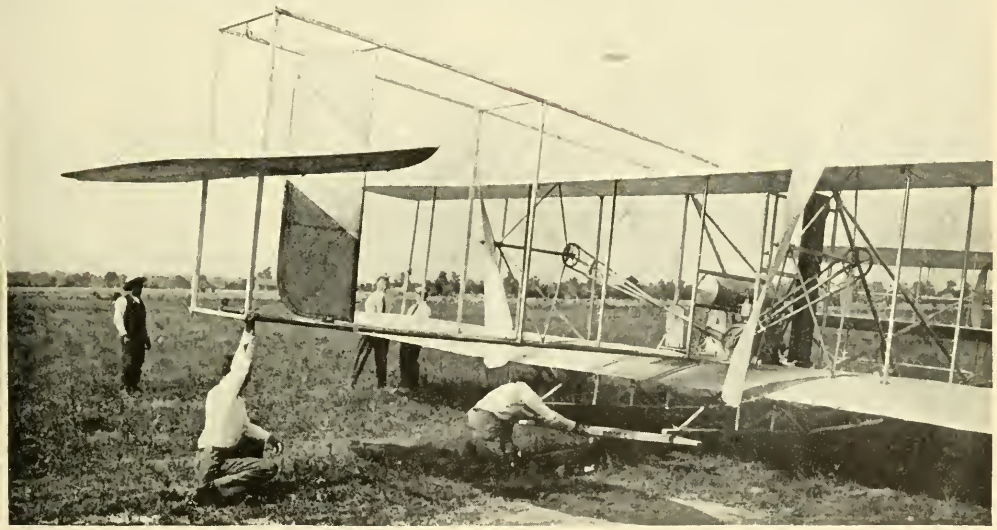
Wright Students Complete Training.

Dayton, O., June 11.—The Wright Company closed the Montgomery camp the last of May. As the pupils there had practically completed their training they were brought on to Dayton to help train the new men. Since that time, flying has been done in all kinds of weather and in winds running up to thirty-two miles an hour. The men are taking long glides, and in fact, are thoroughly familiarizing themselves with the operation of the machine under every possible condition.

Some sensational flights have been made for altitude, gliding and short circles. Only a few days ago, June 8th, Orville Wright was up to an altitude of about two thousand feet. When about a mile and a half or two miles away from the field he shut off the power and descended on an angle, and to avoid over-shooting the mark, he had to make several large circles. This was certainly an inspiring sight.

Duval La Chapelle, Paris; Walter Brookins, Dayton Ohio; Ralph Johnstone and Frank Coffyn, of New York, and Arch Hoxsey, of Pasadena, Cal., to get into the air. The ground at the aviation training camp at Dayton is peat, which rises into uneven hummocks and makes what naturally would be thought a most objectionable surface to start or land on. The Wright aeroplanes have no trouble, however.

During the last ten days, more than 161 flights have been made of a total duration of twenty hours. The meet at Indianapolis, June 13th to 18th, is making everyone hustle, the factory is turning out a machine a week, and the Exhibition Department has bookings already to keep at least twenty-five machines going in the fall.



New Stability Plane on Wright Machine

with A. L. Welch, of Washington, are the men who have completed their training.

The photograph shows the students putting the truck under a Wright aeroplane at the Montgomery, Ala., aviation training camp in preparation for starting a flight. The rail on which this rolls is in sections which may be handled easily and quickly placed in position. Unless it is found desirable to make a quick and short start, as in a restricted area, the tower and weight are not used, but the machine travels along the rail with its own propelling force, gaining momentum until the aviator raises the elevating planes and the aeroplane rises in flight. The use of the rail makes it possible to start on short notice on almost any kind of ground affording sufficient open space

Bishop Wright Takes First Trip.

On May 25th the Dayton Aeroplane Club was invited by the Wright Brothers to visit the grounds and witness the flights. Eight were made, on one of which Orville Wright went up to 2,720 feet. In another flight Orville took his father for his first ride, remaining in the air for ten and one-half minutes. The last trip of the day was made by the two brothers together, for the first time.

A committee has been appointed by the Aeroplane Club to arrange for a suitable memorial to the Wrights. The club will also purchase an aeroplane and has two sites in views for an aerodrome. The club now has over six hundred members.

Wright Machines Now Have Tails.

The illustration herewith shows the tail now being used at Dayton. This apparently is either under independent control of the operator or is connected by crossed wires to the front rudder and acts in conjunction with it. A rudder of this nature, under the control of the aviator, has been added to some of the French Wright machines, and in the German Wright machines a fixed horizontal surface, 12 ft. by 2 ft. is also located as shown.

Lots of Flying at Mineola.

Mineola, June 11.—A lot of credit must be given to Clifford B. Harmon, who is the only amateur in the East, at least, who is doing much flying. Since he began flying at Mineola his aerial trips have become longer and longer and he has ventured forth in greater and greater breezes. He has had a couple of accidents of no very serious consequence, though a few days ago in landing a bit abruptly the running gear gave way, breaking some struts and the propeller.

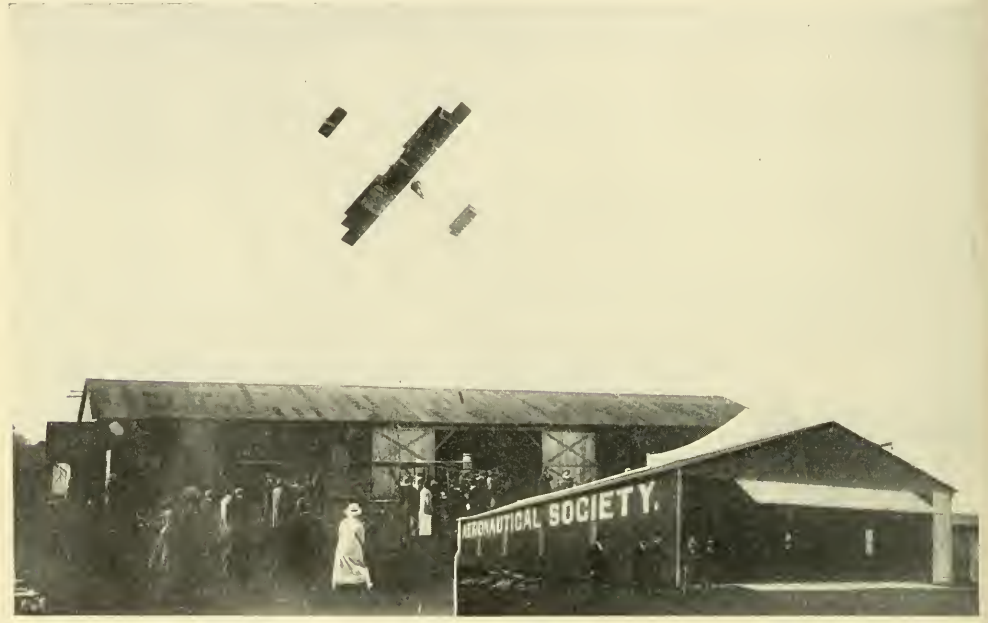
FLIES 55 MINUTES.

His best flight has been one of fifty-five minutes and no one took particular notice of the fact. A year ago this was about the record and the papers described in full detail everybody's aeroplane, even if on paper only.

These accidents Mr. Harmon ascribes to lack of power in his seven cylinder Gnome motor. He has sent abroad for new valve springs which he expects will make everything all right again. Another Farman machine will also be delivered to him shortly.

Joseph Seymour, the auto race driver, has made more than a hundred flights, from little jumps to one of twenty minutes day before yesterday. Seymour, who bought A. P. Warner's Curtiss, claims that he finds it very difficult to turn to the right, which is in the opposite direction to that of the rotation of the propeller, and a larger circle must be made than when turning to the left. The ailerons seem to have greater effect and stability is more easily maintained when turning to the left. In flying straightaway in calm air no turning movement of the aeroplane itself is noticed.

Captain Baldwin, since the first of May, has had about twenty days' flying, beginning with just runs on the ground and getting up to a fifteen-minute flight. Captain Baldwin believes in a low center of gravity and has his motor placed low down on the lower plane, driving his propeller by a chain. While he uses ailerons now, he will shortly put back his vertical fin on top of the upper surface.



Hamilton making a Sensational Dive over the Aeronautical Society's Shed *N. Y. World Photo*

Harry S. Harkness is completing a big shed to house his Antoinette.

W. L. Fairchild has installed his Reqna-Gibson motor, and will be ready in a few days to give his his monoplane, which comprises some new features, a try-out. In the next issue we will be able to give full details of the machine.

In the Aeronautical Society's shed, Frank Van Anden has a new biplane, W. J. Diefenbach is still working on his biplane, the Louis Rosenbaum monoplane is nearly ready for trial and Miss E. L. Todd has her machine there. Edwards and Edick have a Curtiss-type biplane with a motor of their own make installed.

Francois Raiche, who built a Curtiss-type biplane for Daniel Frisbie, of Rochester, started to try it ont on June 8th. The engine was cranked, Raiche got in the seat, touched the accelerator

and—but the machine did not move. Raiche looked wonderingly around to see why it didn't go, but there was nothin' doin.' The machine was given a good strong push and it ran along for ten yards when the propeller came off and the crankshaft broke in two. The engine has four cylinders, opposed, arranged horizontally. On a previous trial of the engine, the cylinders broke.

Hamilton Flying at Mineola.

On the day of the Curtiss flight, Hamilton and his machine arrived in New York. Within a few days it was down at Mineola where Hamilton did some of his highly sensational flying for the benefit of the hundreds of people, automobile parties from New York, wealthy residents of nearby summer colonies, who are on hand daily now to watch the flights of Hamilton, Harmon, Seymour and Baldwin, and to look over the other machines being built there in the sheds and tents.

Hamilton goes up to a height of several hundred feet and then makes a dive to the earth at an angle of nearly forty-five degrees. Within twenty-five or thirty feet of the ground he shoves up his front control and the crowd breathes a sigh of relief at the safe and easy landing after the fearful dip. On only one occasion here has he carried a passenger.

On June 5th Hamilton began covering the machine anew with cloth, as the old material had become worn out with almost daily use in all kinds of weather, in preparation for the flight to Philadelphia, and on the 8th he made a trial flight with the new covering.

FLIES 66 MINUTES.

The weatner delayed Hamilton's projected flight to Philadelphia and the aeroplane was not ready at Governors Island till the afternoon of June 11. Toward evening Hamilton made a great flight of 66 minutes, soaring and swooping like a gull over the ferry boats plying the harbor, not landing until it was pitch dark.

On Sunday, the 12th, another flight was made in the drizzling rain of about ten minutes.

STEVENS GIVES ADVICE TO FLYERS.

A. Leo Stevens offers a valuable suggestion to aviators. He argues that aviators should carry with them on the machine on cross-country flights a spare propeller. This would add little weight to the machine and would certainly avoid delays dependent upon the breaking of the propeller.

Erickson Gets His Plane Off Ground.

After experimenting for several months with two different biplanes, Louis G. Erickson, of Springfield, Mass., finally made good. On May 12 he rose about ten feet in the air, traveled sixty feet or more at a very uncertain angle and then shut off the power just as it looked as if the biplane would turn completely over and bury the aviator beneath its wreckage. On May 20 another trial was made, but no better results obtained.

This is the second biplane Mr. Erickson has built. He is now working on another biplane, the planes of which will be 5x30 feet. The frame will be of spruce and bamboo, and the fabric will be rubberized silk instead of varnished cambric.

DETAILS OF THE ERICKSON II.

Main planes, which are perfectly flat, measure 20 ft. by 7 ft., covered with cambric, which was treated with linseed oil and Japan, equal parts of each. Bamboo construction is used altogether for ribs and main beams. Ribs placed 1 ft. apart and tied to main beams, overlap of 10 in. to the rear. Ribs, ⅝ in. diameter. The uprights are 1 in. bamboo, 4 ft. 6 in. in length. The riser is 2 ft. by 6 ft., bamboo frame also. The rudder is 2 ft. by 6 ft. horizontal and 2 ft. by 3 ft. vertical. Both riser and rudder Curtiss copy. Outriggers to riser and rudder are 1-in. bamboo, distance of each 11 ft, 6 in. Ailerons, 2 ft. by 6 ft., work with shoulder brace. Chassis, 32 in. by 20 in., regular aeroplane wheels with Hartford Aviator Tires, set same as Curtiss type. Bracing, No. 18 piano wire used with copper ferrules. Propeller 6 ft. 6 in., 11 in. at ends, made of Philippine mahogany, laminated 6 pieces, true screw. Motor power, a 30 H. P. Harriman-Fitzpatrick make, turning propeller 1,000, developing about 200 to 225 pounds thrust, holding aeroplane by means of rope tied to floor. Weight complete with motor, 475 pounds.

Flights at Plum Island.

William Hilliard, an auto racer of Boston, has been making successful flights in a Herring-Burgess machine at the company's trial grounds at Plum Island, Mass.

The Herring-Burgess aeroplane bought by C. W. Parker, a showman of Abilene, Kans., made its first flight since the latter's ownership on May 20 at Salina. Shortly after it left the ground it was struck by a gust of wind and LaComme, the inexperienced pilot, shut off the motor. A couple of braces in the running gear were broken.

Indianapolis Meet Opens.

Indianapolis, June 15.—The second day of the meet closed yesterday. Five Wright aviators are here and in addition are: J. W. Curzon [Farman], M. Marquette [Marquette], B. R. Shaw [Shaw], Lincoln Beachey [Beachey] and G. L. Bumbaugh [Fisher].

Previous to the opening the Wright aviators made some preliminary ascents.

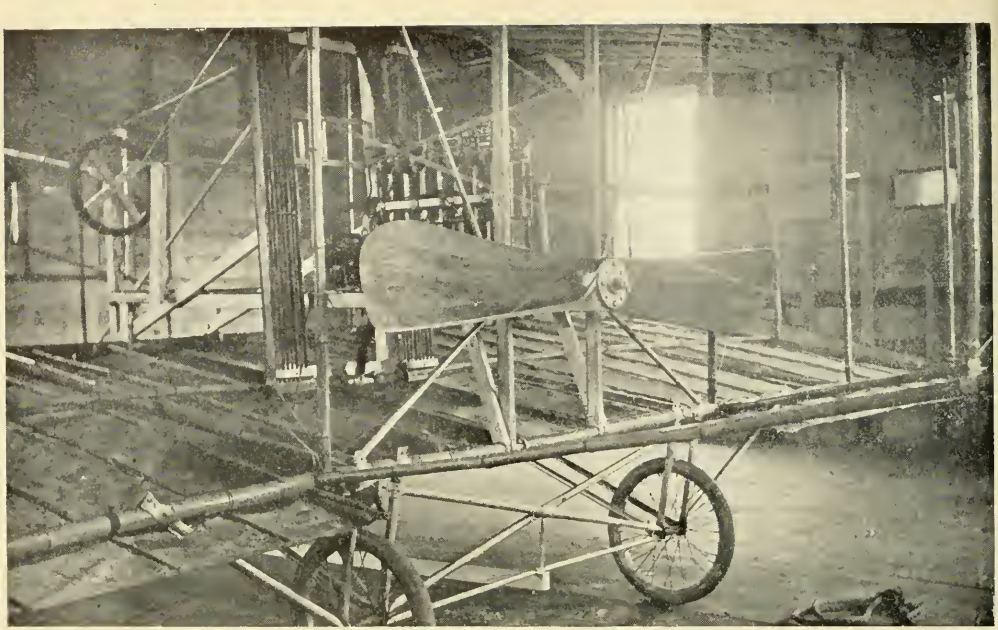
NEW WORLD ALTITUDE RECORD?

W. H. Brookins [Wright] flew to an altitude of 4384 feet. A confirmation of this was sought and the corrected height put at 2100 feet. There may be an error in the sending of one or the other of the messages. Orville Wright himself made a short flight. Brookins made 6 miles for the fastest 10 mile prize. A. L. Welsh [Wright] made the mile trial in 2:32. Brookins gave a spectacular exhibition of figures, sharp turns and a dive. Two machines were in the air at once, each carrying a passenger for 12 minutes.

Brookins [Wright] made a trial high flight, going up to 2093 feet. In the second trial he did even better, being measured at 4384 feet by A. B. Lambert of the St. Louis A. C.

G. L. Bumbaugh met with an accident in a machine of local make, after getting sixty feet in the air. Bumbaugh, the veteran balloonist and dirigible pilot, was caught under the machine when it fell, and painfully injured.

Full details of the meet will appear in the next issue.



The Erickson Biplane

New Machines

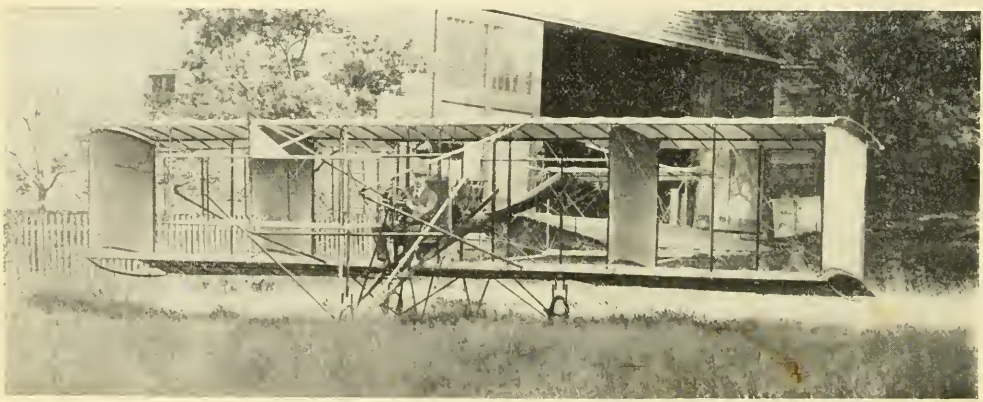
Bicycle Rider Turns Aviator.

Charles W. Miller, the world famous six-day bicycle rider, says he expects to win the New York-St. Louis $30,000 prize.

Mr. Miller has just had completed by Messrs C. and A. Wittemann, of Staten Island, an aeroplane of his own design, equipped with a 75 H. P. Whitehead motor, a comparatively new, high powered aviation motor. With this power Miller's aeroplane, which is of the biplane type, is expected to carry three.

The main planes spread 35 ft., by 6¼ ft. fore and aft. These are covered with No. 6 Naiad cloth laced to frame and stretched to drumhead tightness. These are spaced 6 ft. apart.

The steering is operated by a wheel as in an automobile, somewhat similar to the Curtiss arrangement. The front elevator has an 8-ft. spread, by 2½-ft. depth. A double surface, self-balancing tail is provided for stability, with a single vertical rudder in the center. Vertical surfaces between the planes, similar to the Voisin machine, tend to maintain lateral equilibrium. The machine is trussed with steel aero cable, galvanized to prevent rusting, fastened to Wittemann turnbuckles and specially designed eye bolts.



Chas. W. Miller's Aeroplane, Built by Wittemann

The chassis is equipped with three pneumatic tired wheels, the rear wheels having a spring shock absorber, as shown in the June number.

The ribs are three ply, laminated ash and spruce. The weight of the machine, complete, is 760 pounds. The magneto is Bosch high tension radiator El Arco.

The propeller of the Miller aeroplane is 8 ft. in diameter, of 6-ft. pitch. The Whitehead Company reports that "On test it gave 270 pounds thrust, but this by no means utilized the power of the engine, the propeller being one that was merely calculated to drive the aeroplane about thirty-eight miles an hour. For higher speeds Miller will carry different propellers.

"On a preliminary test, the engine with a 10-ft. propeller, with a 7-ft. pitch, and 17-in. width of blades gave a thrust of 410 pounds.

"This is the greatest thrust that has ever been developed by a single engine on a single screw for the given power and pitch speed, which was 5,600 ft. per minute.

"The Whitehead motor in construction is of the utmost simplicity, there being no valves, springs, cams, cam shafts, rocking arms, or intake manifolds. There is absolutely nothing to get out of order. The utility of the two-cycle type and its ability to make long runs without getting out of order is generally recognized. The Whitehead motor has reached a degree of perfection which has neve before been attained by this type of engine, and its lightness, only 260 pounds, makes it the leading engine for aviation."

The Andrews Biplane.

E. F. Andrews, of Daytona Beach, Fla., has built a biplane which has a wing spread of 43 ft., the top plane being about 4 ft. shorter than the bottom one. The planes are 7 ft. wide at the middle and 4 ft. 3 in. at the tips, and are 6 ft. apart. The top plane has a very small curve and appears to be set level, while the bottom plane has a much deeper curve and is set at a considerable angle. Lateral stability is maintained by the raising and lowering of the bottom planes, making them more or less effective.

The gyroscopic force of the revolving cylinder motors also tend to keep the machine on an even keel. When the machine was first put together there were two horizontal rudders, 6 ft. by 4 ft. 3 in.—one 14 ft. in front and the other the same distance in the rear, but after a few trials another surface was added to each rudder. The rear one was made stationary and the front one was moved to within 10 ft. of the main cell. With this improvement the machine flew about 100 ft. at a height of 6 ft. The flight was stopped by the breaking of the tail. Owing to breakages, no more flights have been made.

There are two revolving cylinders, 36 h. p. Adams-Farwell engines, set one on each side of the aviator. These drive direct two 7 ft. 4 in. tractor propellers of 4½ ft. pitch.

The machine weighs about 600 lbs. and is mounted on three small wheels without springs. The horizontal and vertical rudders are controlled by two small wheels, one above the other, while the balancing planes are controlled by foot wires.

Demoiselle Type Made in Seattle

Sails Over New York.

New York, June 14.—Fred Owens sailed his 6 H. P. dirigible from Hillside Park, Newark, across New York to-day. Passaic was crossed, then the Hudson River to the City Hall. The engine got going bad and he attempted to land on the roof of the City Court Building. Someone in his zeal to help grabbed the trail rope and the airship hit the chimney, breaking the frame and stopping the motor. The ship went up again in this condition and crossed the East River, narrowly missing the Brooklyn Bridge, to a safe, though precarious landing in a tree in Brooklyn, when he was rescued by firemen.

News on the Coast

By Cleve T. Shaffer

The Loose Monoplane.

GEORGE H. LOOSE, of the Pacific Aero Club, has just completed a new aeroplane which he is now trying out.

The machine, 32 ft. spread, 31 ft. long, and 7 ft. high, is noticeable for its bird-like lines. It is very well and strongly built, having a number of novel and original features, several of the con structural details being especially praiseworthy.

Planes, in two halves, do not attach direct to body but join together a few inches above the inverted triangular frame, where they are held by rigid connections; are 10 ft. deep at the joining and extend 16 ft. laterally, the depth of the curved ends being 7 ft. 6 in.; total surface 275 ft.

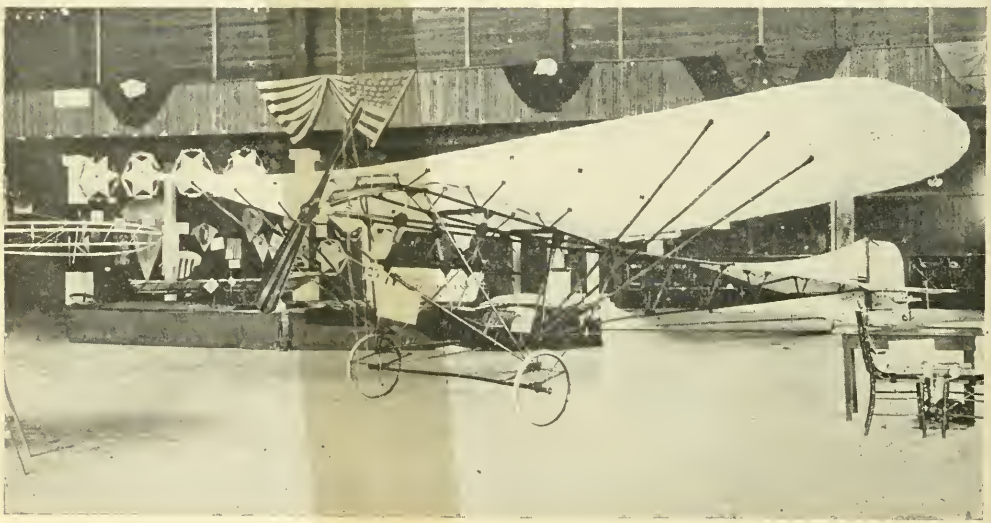
Construction, double covered ribs, ½ in. by ¼ in., 6 in. apart, 3 built-up lateral wing bars or beams, 1 in. by ¾ in., with ½ in. blocks between. Curvature, arc of a circle, a little over 1 in 19, greatest depth at approximately center of plane.

Incident angle on ground 9 degrees, flight about 5 degrees. Three bamboo poles 12′ 2″ long, reinforced with two wires, on each side, one behind the other in the plane of flight, take the weight and also a part of the lift of the planes, being fixed to the chassis at their lower ends in such a manner as to be easily removable in demounting wings.

Mounting. The novel idea of using full elliptic springs is, I believe, in this machine its first adaptation to the aeroplane. Tread, 8 ft.; wheels, 26″; rims and tires appear rather too narrow, hub 6″. Steel tubing axle supports the two 28″ by 1½″ elliptic springs, one on each side. Eight 1″, by 16 guage steel tubes, 4 on each side, branch from spring clips and support the bird-shaped body.

Body. 1¼″ round spruce members connected with same ingenious patent fasteners, as shown in photo of former machine (AERONAUTICS for April) form an inverted triangle; the front carrying a special alloy casting which holds the front bearing (R. I. V.) of the propeller shaft, fins cast integral allow the frame members to be bolted to casting making a very rigid front bearing, the inner end of casting taking the thrust or pull bearings. Uprights, 35″ apart, guyed with piano wire and turnbuckles of own make. Seat of aluminum 2 ft. from ground, placed over lower frame member. Two wire-wrapped, steel-shod skids are placed at the rear extremity of the frame.

Rudders and Keels. Horizontal rudders, Antoinette type, front edge 18 ft. back from rear edge main planes, 2 triangular surfaces 4 ft. wide 28 in. deep, between which is a vertical rudder 44 in. high by 30 in. wide. These rudders are kept in their normal position by spiral springs. The entire rear rudder construction is of small steel tubing properly brazed.



George H. Loose Machine

Keels, both horizontal and vertical are in evidence, tapering down from size of rear rudders to a point 10 ft. therefrom on the frame and having about 40 sq. ft. in the horizontal and 34 sq. ft. in the vertical.

Power Plant. In deference to Mr. Loose wishes, description of motor, further than it is a 4 cylinder 3¾″ by 4″, 25 H. P., is withheld as is method of lateral control. The motor placed in front of and above operator drives by a short chain. The driving member is a 9″ diameter 3½″ face cone clutch, mineral-tanned leather face. Gear ratio

2 to 1 of propeller. A rear propeller shaft bearing is affixed to the front of motor. In "Mounting" have given description of front and thrust bearings. A clutch lever extends to within reach of operator's seat.

Propeller is 7½ ft. diameter, 8 ft. pitch, but looks to be wasteful of power. R. P. M. stated 800.

Radiator, constructed of brass tubes 1¾" wide, is of neat workmanship, specially built for this machine by the Pacific Radiator Company of San Francisco. It is of a triangular shape and fits into the body frame-work over the motor, not increasing drift to an appreciable extent. It is doubtful to the writer if the comparatively high pitch speed, 8x800=6,400 ft., can be realized with the 25 H. P. and 7½ ft. diameter propeller.

The weight of machine complete with operator and fuel for 10 miles is about 700 pounds, which compares favorably with the Bleriot XI, the latter having 23 H. P. and 151 sq. ft. lifting surface.

The body design is ideal in allowing propeller shaft free passage.

Miguel Lebrija has demonstrated that an aeroplane will fly in the altitude of Mexico City (7,500), and with a Bleriot monoplane he recently made fifteen successful flights on the plains of Valbuena.

Starting from the hangar, Mr. Lebrija ascended to the height of sixty-five feet and successfully steered his machine around and around through the air, maintaining that height for five minutes when he descended. After receiving the congratulations of his many friends who witnessed the performance, Mr. Lebrija again mounted his seat and made fifteen more flights, all more or less of the same duration as the former.

Machine Used Was A Bleriot Monoplane.

The machine he used in his wonderful performance was a monoplane of the Bleriot type similar to the one used for the cross-channel flight by Bleriot and was not equipped with any special motor or attachments, but was simply a stock machine as received from France.

In starting the machine left the ground 200 meters (666′ 2″) from the starting line and rose to a vertical height of about sixty-five feet, and during the many trials this height was not exceeded by the aviator, but he stated that he could have gone much higher if he had so wished.

Apparatus under Perfect Control.

The monoplane was under perfect control and obeyed the rudder with ease and when landing glided gracefully to earth and stopped without any perceptible jar. No accident occurred during any of the flights and there was no difficulty experienced with the motor and Mr. Lebrija, by these flights has plainly demonstrated that heavier than air machines can be flown successfully in this altitude, and the former theory that this was impossible on account of the experiments made with a few buzzards brought from Veracruz which died, a few days after reaching here, was completely exploded.

Yesterday Mr. Lebrija while trying out his machine, arose to the height of about thirty-five feet, and maintained that height for about ten minutes to the delight of the numerous spectators that had gathered around to witness the flight.

Mr. Lebrija while in the air stopped his motor and glided towards the ground, and when about fifteen feet from terra firma, started the motor again and rose to a height of about seventy-five feet. Then stopping the motor he gracefully glided to the ground, making a safe landing. After this Mr. Lebrija made several other flights, all of which were successful.

Flying in Mexico

By E. L. Ramsey.

Mexican Army Is to Have No Balloon Corps—War Department Denies Rumors to That Effect.

For some time rumors have been current to the effect that the Mexican Army was going to be equipped with an Aerial Fleet for which purpose a number of Aeroplanes and Dirigible Balloons had been purchased and that the equipment would soon arrive in Mexico.

These rumors were denied at the war department yesterday by Col. Luis Perez Figueroa, who stated there was no truth in the reports. Col. Figueroa said:

"Some officers of the Mexican Army have been commissioned to study aviation in various countries, but further than this, the war department has not taken any steps to equip the Mexican Army with Aeroplanes or Dirigible Balloons."

An Aviation Treaty Between Mexico and the United States for the Proper Regulation of Emigration and Smuggling.

The Mexican Ambassador in Washington, Sr. Francisco L. de la Barra and Secretary of State Knox, have been discussing a treaty between the United States and Mexico with regard to aerial navigation and which will have for its purpose the enforcement of the treaties at present in force with regard to emigration and smuggling.

The treaty which will be signed by Mexico and the United States will be the first of its nature in the world as up to date, while the several nations of the world have apparently become alarmed at the perils offered by aviation in the event of war, they have done nothing towards solving the problem as regards the improper passage over frontier lines.

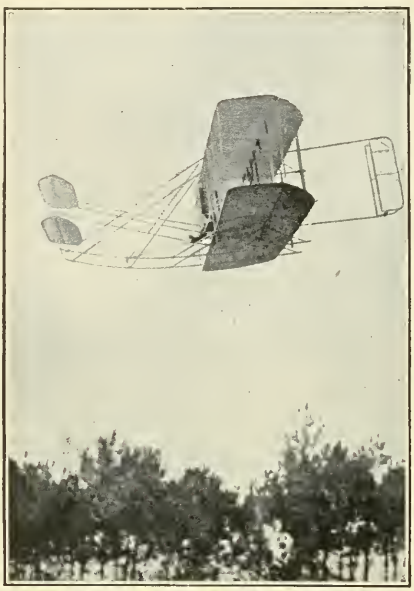
March 18, 1910.

Enclosed find money order for $3 for which please renew my subscription to your valued publication. If I should miss a copy I would want to sue you for all you've got.

H. D. CALLAHAN.

San Saba, Tex,

Meets and



Coming Events

Tanforan Meet Held in Conjunction With Auto Races by the San Francisco Motor Club.

The Greene biplane belonging to Roy Crosby, equipped with a new motor and having a number of changes in its make-up, was brought out on the field at Tanforan, Cal., May 29th and 30th, but the wind was evidently too strong for the new aviator, Harold Hall, to buck against. Hall, who is only 18 years old, has made several flights with this machine and also has flown Frank Johnson's "Curtiss."

The gliding contests attracted a large number of entries. All flights were towed. The two-rope way of towing is open to criticism, it being in the writer's opinion a dangerous method.

Ten-year-old Walter Sittman won first prize of $100 for height, Wolf and Becher won second. A novel feature was the flights by the three young Misses Johnson, one of whom won second prize.

The second day the first prize was won by Harold Winthrop; second prize by J. Sittman, the Becher and Wolf gliders winning three prizes.

Robert Bergfeld, while being towed by two autos had a bad fall owing to a rope breaking. The glider was totally destroyed, Bergfeld having a lucky escape.

Exhibition at San Jose.

San Jose, Cal., is tired of aviation and the promoters of the Auto and Aero Show during the Rose Carnival, had a hot argument with Frank H. Johnson, who has been giving none too sensational exhibitions with his Curtiss machine. Johnson is reported to insist on pay whether he flies or not. During the fete Johnson made one or two short flights and Harold Hall took Whipple Hall's Curtiss machine for a mile.

University of Illinois Flights.

The aviation "meet" of the University of Illinois, at Urbana, was a fizzle, all but the kites of Samuel F. Perkins, who had his usual big display of kites to make good when the aeroplanes fail to fly. In a preliminary flight the day before the exhibition day, May 21, Otto Brodie considerably damaged the Curtiss aeroplane. The wreck was brought back to the university wood shops, and with the help of instructors, employes and students, was repaired late at night. Nothing more was done until the 23rd, when they took it out on the golf links. (In the repairing different wood had been used, and it had been rained upon, soaking it and putting the machine out of balance.) Brodie ran the machine several hundred yards, under power, on the ground, and then flew back to the starting point, hit a small sapling, and —two hours or so for repairs. Brodie or Wild made eleven starts, and once rose almost two feet off the ground and stayed up for almost thirty feet. So everyone came back in disgust and the machine went back to Chicago the next day.

The reasons ascribed to the failure of the event were: The unbalanced condition of the machine, and the overweight, due to the soaking; the smallness of the field, 400 or 450 yards; the crowding of the spectators, and the possibility of the engine being underpowered.

First National Novice Meet.

St. Louis, June 12.—The first real aviation meet at which no other inducements than prizes are offered will be held at St. Louis, July 11 to 16, the postponed dates of the First National Aviation Meeting for Novices of the Aero Club of St. Louis, which was to have been held June 20 to 25. Already four actual entries have been received on the entry blanks provided for the purpose for the first time in America, accompanied by the $10 entry fee, to be refunded to entrants whose machines are on the ground Saturday previous to opening day.

Seven more entries are promised from out-of-town owners or builders, while five St. Louisans have signified their definite intention to participate. The first entry came from William Thomas of Hammondsport, N. Y., with his biplane, recently described in AERONAUTICS. Other entries came from William Curtiss Robinson, of Grinnell Ia. (monoplane), and from Eric Bergstrom, Chicago, Ill., with what he claims is the smallest monoplane for its carrying capacity in the world. Howard Gill, of Los Angeles, Cal., entered a Gill Dosh biplane, and expects to enter a Curtiss-type biplane also.

Entries will close at the regular fee on June 30. They will be accepted at $20, not to be refunded, until July 5, and until July 9 at $100, not to be refunded. Blanks and all particulars can be obtained upon application to E. Percy Noel, secre-

tary of the Aero Club of St. Louis, 304 North Fourth Street, St. Louis.

The meeting was postponed in order to gain time in which to obtain larger grounds to accommodate the number of machines of which entry was promised. It is now expected that twenty planes will be on the field, and the construction of half that many sheds will be begun at once, others going up as entries are received.

The new grounds will be sufficiently large for all purposes and will form the permanent aviation field of the Aero Club of St. Louis, to be known as Camp No. 3. The Aero Club has already established a small field within the city limits, where H. A. Robinson and J. N. Sparling are practicing with their machines.

Aeroplanes Will Fly in Montreal.

Montreal is giving evidence of her progressive spirit by announcing an aviation meet to take place there, commencing on the 25th of June and lasting until the 4th of July.

The meet will be held under the auspices of the Automobile and Aero Club of Canada, which is affiliated with the mother institution in Great Britain, and is being organized by E. M. Wilcox, publisher of *Motoring*, and C. W. Bennett, a well-known Canadian theatrical magnate.

Five Wright machines will definitely fly and it is expected several others will participate.

St. Louis to Hold Show.

Under the auspices of the Aero Club of St. Louis, the St. Louis National Aero Show has been organized, and will be held in the Coliseum Building, October 8th to 13th, during the period when outdoor aeroplane and balloon events will take place in St. Louis, and is under the management of G. L. Holton.

The Aero Show will be a complete exhibition of things aeronautic, and will include displays of nearly every manufacturer of aerial apparatus and supplies in America, and agents for foreign makers.

In kindly offering free news service of the show, the promoters state:

"The show has been organized with a serious purpose, which we believe will be appreciated by the press of America, in that the object is to advance the American aeronautic industry so that it will compare favorably to the industry which already exists abroad."

Aeronautic Calendar for U. S.

June 13-18—Indianapolis, Ind., "First Nat. Aviation Meet," with exhibitions with Wright machines and open to all others.

June 18-19—Louisville, Ky., flights by Curtiss and Mars.

June 21-26—Nashville, Tenn., exhibition flights at Military Tournament by Hamilton.

June 22-25—Minneapolis, Minn., flights by three Curtiss aviators.

June 22-26—Minneapolis and St. Paul, Curtiss, Willard and Mars.

June 28-July 5—Montreal, Can., aviation meet, with five Wright machines and others.

June 29-July 1—Sioux City, Ia., ~~Willard and~~ Mars.

July 2-4—Aurora, Ill., exhibition, one Wright machine.

July 2-5—Pittsburg, Kan., Wright flights, one machine.

July 4—Washington, D. C., balloon races.

July 5-6—Peoria, Ill., balloon race.

~~July 9-13—Omaha, Neb., Curtiss, Willard and Mars.~~

July 9-14—Omaha, Neb., flights by Curtiss, Willard, Mars and others.

July 11-16—St. Louis, balloon race and aviation meet for novices.

August 12—Indianapolis, Ind., balloon race.

Sept. 5-10—Lincoln, Neb., exhibition flights by Wright aviators.

Sept. 5-10—Hamline, Minn., exhibition flights by Wright aviators.

Sept. 17—Indianapolis, Ind., elimination race for Gordon Bennett balloon race.

Sept. 19-24—Detroit, Mich., Wright exhibition flights.

Sept. 26-30—Trenton, N. J., exhibition flights by Wright aviators.

Oct. 1-8—Springfield, Ill., exhibition flights by Wright aviators.

Oct. 3-8—Sedalia, Mo., exhibition flights by Wright aviators.

Oct. 5-15—St. Louis, Mo., aeroplane exhibition.

Oct. 8-13—St. Louis, Mo., Aero Show.

Oct. 17—St. Louis, Mo., Gordon Bennett balloon race.

Oct. 22—Mineola, N. Y., Gordon Bennett and other aviation contests.

Dec. 1-8—Chicago, Ill., aeronautical exhibition of A. C. of Illinois.

Model Flights.

At Hempstead Plains, Mineola, Long Island, there will be cross-country model aeroplane flight contests every Saturday afternoon, also kite flying contests free to all.

Mr. Edward Durant, director of the Junior Aero Club of America, has donated silver cups for both contests, and the president of the Mineola *Press*, Mr. J. H. Ellensohn, is in charge of the contests.

Members of the New York Model Aero Club will also compete in the model contests, and the school boys of Garden City and Mineola will be active in competing for the kite-flying contest cup.

Frank Schober made a new record in model contests at the 22nd Regiment Armory, New York, June 4th, by flying a Langley-type model 215 ft. 8 in. The model was launched or started from the floor.

On May 21 the West Side Y. M. C. A., New York, held another model contest at the 22nd Regiment Armory. At this contest there was a new cup offered by M. P. Talmage for the boys' class, to be flown for by machines having two propellers. The first leg was won by Frank Schober, 164 ft. 4 in. Second was F. M. Watkins, 154 ft. 5 in., and third, C. G. Halpin, 139 ft. 10 in.

In the men's class Mr. M. P. Talmage, with a Wright biplane, flew 132 ft. 1 in. This is the longest flight ever made with a biplane at any of the contests. Dr. Dederer gave an exhibition flight with his new machine and succeeded in making 195 ft., the longest flight made by any machine since the flights were started.

News In General

AFFILIATED CLUBS REVOLT.

Form New Organization.

Resenting its deeds and misdeeds, its arrogant attitude, the lack of representation, so on and so forth, half of the affiliated clubs have formally cut the strings of the Aero Club of America's apron and will now shift for themselves as best they may.

This happened at a meeting of the affiliated clubs called by the A. C. A. and held in its rooms on May 23. When the delegates were called to order in the morning there seemed to be no business to transact except to renew affiliation for another year and make any suggestions to the mother club which might or might not be acted upon in the discretion of the board of directors. Someone moved to adjourn.

Following were the delegates assembled: A. B. Lambert, Indianapolis and St. Louis; Col. Jerome H. Joyce and A. Albert Hughes, Baltimore; A. W. Carpenter, Harvard; W. B. Strang and George M. Myers, Kansas City; James E. Plew and Victor Lougheed, Chicago; J. V. Martin, E. C. Brown and R. M. Allen, Harvard Aer'l Society; J. S. Fanciulli, Washington; J. M. Satterfield, Buffalo; Alan R. Hawley, Pittsfield, and Augustus Post, Canton.

In the afternoon a second meeting was held. Samuel H. Valentine, the chairman of the morning meeting, Philip T. Dodge, Augustus Post and Alan R. Hawley, all of the A. C. A., withdrew at the second session, after granting the use of the club rooms. Jerome S. Fanciulli, representing the Washington Club could not officially represent that body at the afternoon meeting.

A resolution was adopted calling for the organization of the American Aeronautic Association, which was then formed with George M. Myers, Kansas City Aero Club, President; A. B. Lambert, St. Louis Aero Club, First Vice-President; J. V. Martin, Harvard Aeronautical Society, Second Vice-President; Victor Lougheed, Aero Club of Illinois, Secretary, and Col. Jerome H. Joyce, Aero Club of Baltimore, Treasurer.

The reason for the new organization was defined in the following resolution, which was unanimously adopted:

> "We recommend that for the administration of Aeronautical affiairs, of national or local character in the United States, the American Aeronautical Association be formed at once, with officers elected to serve until June 22nd, 1910, in New York City, at which time we recommend that new officers be elected for the ensuing year.
>
> "We further recommend that all aeronautical clubs and bodies now existing or in the future to be organized in the United States, including the Aero Club of America, be invited to join this Association upon some acceptable basis of powers and representation, founded upon the numbers of such clubs, or upon their membership, in accordance with rules and regulations to be enacted into permanent form by the representatives of affiliated clubs here assembled, and to be revised from time to time as may be decided at future meetings of the representatives or delegates of affiliated clubs."

The following letter was delivered to the A. C. A. together with a copy of the resolutions printed above:

> "New York, May 23, 1910.
>
> "To the Aero Club of America,
> "29 West 39th Street,
> "New York City.
>
> "Gentlemen:
>
> "At the meeting held today by representatives of the affiliated aero clubs, assembled in response to your call at your headquarters, 29 West 39th Street, after discussion it was decided that the best interests of the affiliated clubs could not be advanced by conforming to the proposed arrangement between your organization and the Wright Company, and that the future of the affiliated clubs and the interests of aeronautical development in this country could be better conserved by a separate organization, which would not be fettered by the entanglements now existing by reason of our connection with your organization.
>
> "The meeting was, therefore, adjourned without action, immediately after which the affiliated club representatives called a meeting for the purpose of organizing the American Aeronautical Association, to be a democratic organization, representative of the aeronautical interests of the entire United States, for the purpose of controlling aeronautical events in this country.
>
> "In accordance with the expression of opinion in the foregoing resolution, you are cordially invited to send delegates to our next meeting.
>
> "In closing we wish to extend our sincere thanks for the courtesies of your organization.
>
> "Respectfully yours,
> "THE AMERICAN AERONAUTICAL
> "ASSOCIATION,
> "Per VICTOR LOUGHEED,
> "Secretary."

New National Body Organizes June 22.

On June 22 in New York there will be held a big convention with representatives from a large portion of the eighty-odd aero clubs in the country, at which time officers will be elected for the ensuing year, plans formulated for the work of the body, the adoption of rules governing contests and the various prize offerings now awaiting the action of the convention, etc.

As announced in the last issue, the movement for a national body was started by the issuing of a letter by Hudson Maxim, president of The Aeronautical Society, to all the aero clubs of the country. This met with great response.

The day following the secession of the A. C. A.'s clubs several meetings were held between representatives of the newly formed American Aeronautic Association, and of the Aeronautic Federation of America with the result that the convention of June 22 will be a joint affair comprising delegates from all the clubs with which correspondence has been had by both movements.

At a meeting held on June 2 of the Aeronautic Federation of America a temporary committee was formed taking in members thereon appointed for this service by the various clubs associated with the federation. Some forty clubs are represented on this committee, which is headed by Professor David Todd, of Amherst, and Thomas A. Hill, who has been one of the most over-worked energetic enthusiasts in the movement and is doing all the work of the committee up to the time of the convention, was made Secretary-Treasurer.

A proposed constitution and by-laws for adoption at the convention is being put into shape now by Mr. Hill. Daily more clubs are being added to the list of those sending delegates to the convention.

ALL CLUBS FOR HARMONY.

The Aero Club of Washington is watching the new movement with great interest. Dr. A. F. Zahm hopes that the "final outcome will be one grand aeronautical organization embracing the whole country and enjoying solidarity and harmony of action."

While the Aero Club of Ohio has renewed its affiliation with the A. C. A. for another year, the secretary, Mr. J. Blake, states: "We * * * hope that some course will be adopted that will promote general harmony."

Wright Injunction Vacated.

New York, June 15.—Yesterday the U. S. Circuit Court of Appeals vacated the temporary injunction granted the Wright Company against the Herring-Curtiss Co. by Judge Hazel at Buffalo.

The history of the action is as follows:

The Wright Co. moved for a preliminary injunction before Judge Hazel. He held the infringement and validity of the Wright patent had been proved without doubt in the hearing and granted the relief prayed for. Judge Hazel, however, was willing to suspend the issuing of the order, but required the defendants to put up a $10,000 bond until the appeal, which was immediately taken by Curtiss, was decided. Now the Court of Appeals has reversed the Hazel opinion, with costs, and a trial of the infringement suit will now be had before Judge Hazel, with cross-examination of witnesses. The $10,000 bond is cancelled.

The reversal of opinion in the case is not a criterion of the outcome, for no trial on merits has been held. The Court of Appeals merely holds that on account of sharp conflict of evidence and the number of affidavits submitted after the original decision, infringement was not so clearly established as to justify a preliminary injunction.

Les Aeroplanes—Considerations Theoriques, by Paul Raybaud. (F. Louis Vivien, publisher, 20 rue Saulnier, Paris. Price, 1 franc.) A brief exposé of a new theory on effects of air on moving surfaces, which sets aside much of what has until now been generally admitted on the subject. It is written in French.

Lamson vs. Wright Suit.

Paxton, Warrington & Seasongood, of Cincinnati, representing Becker & Blakeslee, of Los Angeles, Cal., have filed papers in a suit against The Wright Company and Wilbur and Orville Wright, in the United States Circuit Court for the Southern District of Ohio, Southern Division, at Cincinnati, by the filing of a bill of complaint against the defendants stated, Charles H. Lamson being complainant.

The bill of complaint prayed for an injunction restraining the defendants from making, using or selling aeronautical apparatus, such as flying machines, embodying the invention for which Letters Patent of the United States were issued to Mr. Lamson, January 22, 1901, No. 666,427. This patent, it will be seen, antedates by over two years the date of application of the Wright patent under which patent the Herring-Curtiss Company and Glenn H. Curtiss and Louis Paulhan have been sued for infringement. The bill of complaint filed as above also asked for an accounting of damages and profits.

The Lamson patent, while stating that the invention relates to "ribbed aerocurved kites," nevertheless sets forth that the construction is capable of use as a flying machine by the application of suitable propelling and guiding mechanism. The patent discloses means for "tilting or inclining" the tips of the wings or planes at each side of the body, and these means are claimed to be equivalent to those embodied in the Wright patent and in the Wright flying machines.

The patent contains the following claim:

> "The herein-described kite having a central frame, wings projecting out from each side of said frame and means for tilting the tips of said wings with relation to the body of the wing."

Mr. Lamson charges that the Wrights simply incorporated in their flying machine his invention, directed at maintaining lateral stability by warping or twisting the wings or supporting surfaces.

> Becker and Blakeslee say: "We understand the Wrights insist that anybody can use a box kite, but Lamson's kite as shown in his patent is a triplane comprising ribbed aerocurves and connecting posts or upright standards jointed thereto corresponding to Wright construction. Also tip warping or tilting means and a tail or rudder having horizontal and vertical members. Lamson's device as patented and operated resembles closely general flying machine structures minus propelling and guiding mechanism."

Judge Hand, in his opinion in the Wright-Paulhan case, said: "I cannot see any relevancy in this patent."

The larger illustration gives a perspective view of the Lamson kite with the covering removed from the upper wing on one side. The tilting is effected as follows:

> "A general adjustment is made by guys 'K,' each of which is secured at the front lower corner of the frame 'A' and at the under side of the upper arm 'C' by screw-eyes, or by other suitable means. By adjusting

the position of these screw-eyes a general adjustment of the wings on each side may be made. A more delicate adjustment is obtained * * * by loosening one of the diagonal tie-wires of the panel and tightening the other. The simple means here shown for accomplishing this result are two loops *f*, adapted to slide on the uprights *d*, each of the two diagonal tie-wires passing through one of these loops. By sliding both of these loops up or down the inclination of the ribs to the horizontal is adjusted with great precision."

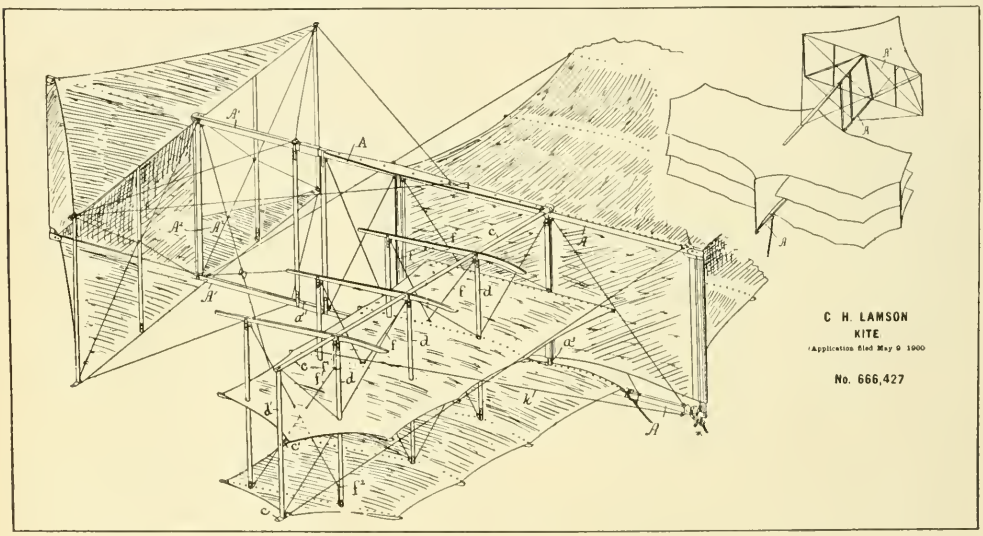
Bibliography of Aeronautics.

A "Bibliography of Aeronautics" has just been issued as Volume 55 of the Smithsonian Miscellaneous Collections. Nearly one thousand pages are required to present the 13,500 references which have been arranged alphabetically by authors, subjects and titles covering the subject down to July, 1909. Mr. Paul Brockett, the Assistant Librarian of the Institution, is the compiler of this valuable contribution to science, and in his introduction he pleasantly reviews the long association of the Institution with aeronautics. There have been published by the Institution two papers on the general subject of aeronautics, and thirty-five publications on various phases of the subject, since 1861. In greater detail Mr. Brockett reviews the splendid contributions of Secretary Langley to this fascinating science. He tells of the publication of his "Experiments in Aerodynamics" in 1891, and then of his further technical contribution on "The Internal Work of the Wind," in 1898. Very briefly is the story told of Langley's two epoch-making flights with heavier-than-air machines. This bibliography is a worthy tribute to the memory of the Smithsonian's late Secretary, and much credit is due to Mr. Brockett for his careful and painstaking compilation.

Army News.

During the last month at Fort Sam Houston, Lieut. B. D. Foulois made six flights in the Army's Wright aeroplane, the longest being one hour and two minutes. High winds and considerable rain prevented flights on most of the days. Lieut. Foulois also had other duties in addition to aeronautical service.

Three instructors and seventeen student officers of the Army Signal School from Fort Leavenworth were on temporary duty at Fort Omaha from May 10th to 15th. Captain C. De F. Chandler was ordered from Washington to Fort Omaha as instructor; two lectures were given and also practical instruction in the generation and compression of hydrogen, spreading and inflation of balloons; the Drachen captive balloon made several ascents, and there was one free balloon trip with Captain Chandler as pilot, and Captain R. J. Burt and Lieut. W. N. Haskell as aids. Signal Corps Dirigible Balloon No. 1 was also used, being manned by Captain Charles De F. Chandler as pilot and Lieut. Haskell as engineer.



Record Kite Flight.

A new world's record in high kite flying was made on May 5 by the Mount Weather Observatory, 23,800 feet, at which point twenty-nine degrees below zero were recorded, the lowest ever registered by a kite-carried instrument. The previous record was also held by this station of the Weather Bureau. The nearest approach to the three Mount Weather records of more than 23,000 feet was made at Berlin, Germany, March 25, 1908, 21,320 feet.

Balloon Record Made Official.

The Board of Governors of the A. C. A. have made official the United States endurance and altitude record established by Messrs. Clifford B. Harmon and Augustus Post on their trip in the balloon "New York" from St. Louis on the 4th of last October. The duration figure is 48 hours 26 minutes, and the altitude is 16,615 feet. A much greater altitude was actually attained, but the barograph only recorded to this height.

Foreign Letter

By Greely S. Curtis.

Paris, June 10, 1910.

The immediate neighborhood of Paris has been very quiet for the last few weeks, so far as aviation is concerned. This is due to the unseasonable weather, which during almost the whole of that time has been either windy or rainy, or both windy and rainy. Two or three hail storms have been thrown in for good measure.

A week ago, however, M. Bleriot, at the suburb of Issy-les-Moulineaux, flew on his monoplane before the Chinese Prince Tsai Tao with, I understand, profitable commercial results. Another attempt by a less practiced hand on May 14th was less successful, the aeroplane being upset by a gust, with some damage to the apparatus.

On May 19th, the weather again permitted flights at Issy just at sunset, and I watched two Bleriots and a Sommer biplane manoeuvre at will above the wide parade ground. Captain Maurice Clement also flew very steadily in the large Clement-Bayard biplane driven by a 4-cylinder 40 h. p. Clement motor fitted with a clutch and gear between the motor and the propeller. Capt. Clement preferred to make his turns while running along the ground, and stuck to low, straightaway flights. His biplane is controlled by means of auxiliary stabilizers of the Herring-Curtiss type.

A Swiss aviator, M. Audemars, was out with his Santos-Dumont Demoiselle. This monoplane traveled very fast, but its pilot also habitually flew low and made his turns almost entirely on the ground. A Voisin cellular biplane was exercised up and down the field, but I did not see it leave the ground completely at any time. It seemed to be quite unstable laterally, even in the comparatively calm weather which prevailed. There were in addition two experimental monoplanes, one a Vendome, which also ran briskly across and around the field. But they, too, kept always in touch with Mother Earth. The exhibition as a whole impressed me with the caution of the French aviators while practising.

The Santos-Dumont Demoiselle is certainly an ingeniously designed and compact little flyer for lightweight pilots. It is a reduction of the aeroplane to its present day minimum limits, and is at the same time an unusually speedy machine. Some eight or ten of these little monoplanes were in the Clement hangar at Issy awaiting their tryouts. Among them was the one which I ordered last December, jointly with Mr. S. A. Reed of New York, for experimental flights around New York City. Before the weather had cleared enough to permit a trial, I had decided to change to a Bleriot. Apparently no one of my weight had ever piloted a Demoiselle (I weigh over 80 kilos; Santos-Dumont is reported to weigh 48 kilos), and the owners of the other machines at Issy were mostly in the featherweight class. In spite of their light weight, however, minor accidents to the apparatus on landing were frequent, and most of the machines at Issy had been reinforced at several points. In view of these and other considerations —the Bleriot, for instance, should be easier to repair after an accident—it seemed advisable to change to the larger and heavier apparatus.

M. de Lesseps' feat of crossing the Channel aroused some interest, but no very great enthusiasm. "Le Temps" of the next day, in fact, left him still in the air, as it recorded his departure from French soil Saturday afternoon and had no report of his coming down again, either on this or on the other side of the channel, or even in the channel itself. Consequently as late as Sunday afternoon rumors reported both success and failure.

I have just returned from an all-day trip on the invitation of M. Henri Farman to the aviation grounds at Mourmelon, near Rheims. Unfortunately M. Farman was not there, but his courteous chef d' atelier, M. Fremri, showed me through the works. The shops are largely of temporary wooden construction, one story high. They are building two types of Farman biplane, both of which carry the high grade Gnome rotating motor. The lighter model has the lower plane some twelve feet shorter than the upper plane, the upper plane in both models being about 35 feet long. The special cloth used is given a smooth waterproof coating after attachment. The cloth is not mounted on the bias, but has the threads parallel to the main dimensions of the machine.

Unfortunately a sharp thunderstorm prevented flying most of the time I was at Mourmelon, but toward evening it cleared off and three or more machines took the air. These included a standard Farman, an Antoinette, and a new model Voisin, with ailerons of the Herring-Curtiss type instead of the familiar vertical panels. The Voisin Company are putting this new style on the market for racing purposes. This change marks the final adoption, by all the prominent French builders, of the Wright method of stabilizing.

The Bleriot, Santos-Dumont, Grade and Tellier are direct copies of the Wright patented invention, while the new Voisin and Clement biplanes follow the Herring-Curtiss modification by using independent stabilizing planes. The Antoinette, Farman and Sommer machines infringe by employing hinged flaps or ailerons on the main planes.

The editor of *L'Aerophile* expressed his gratification and interest when I presented the card of AERONAUTICS. He was naturally familiar with the publication, and much interested in our attempts in America to improve on and avoid the Wright patents. In France they find it difficult to understand the legality or justice of the Wrights' position. It is so obvious to foreigners that the widespread practice of aviation in the United States is smothered by the Wrights that they cannot understand the American acquiescence in what appears to them to be unjustifiable tyranny.

The photographs of the successful Newburyport flights of the Burgess "Flying Fish" aroused the interest of French constructors and aviators, as this is the first successful model, other than the cellular Voisin, which is completely secure against infringing the Wright patent. The first Burgess production is more accurately termed the "Herring-Burgess Flying Fish," as Mr. A. M. Herring personally contributed to the design. This designation, however, leads immediately to confusion with the better known Herring-Curtiss flyer, which is not free from legal difficulties with the Wrights. In this connection, a late issue of *The Car*, London, contains an illustrated description of the Burgess biplane in flight under the heading "The New Curtiss Biplane." The confusion between the two rival machines was perhaps increased by the fact that I was piloting Mr. Burgess' "Flying Fish" when the latter was photographed. Needless to say, Mr. Glenn H. Curtiss, the famous aviator, and I are not identical.

Speaking of the Wright patent, the Paris edition of the *New York Herald* had most interesting news about the revolt against the agreement between the Wright Co. and the Aero Club of America. The new American Aeronautic Association has a wide field of usefulness before it. May it fill it wisely.

Aeroplanes are being exported in large numbers, many of them going to Russia and England. The Farman factory reported that four of their biplanes had been shipped the day before my visit, while the output of the Ateliers Bleriot is said to be approximately thirty a month.

Builders are still hunting for the best motor, and those which give good satisfaction are difficult to secure without a long delay. M. Bleriot took me over all his well-kept works and showed me monoplanes fitted with the following motors: Anzani 3-cylinder, V shape, 25 h. p., air-cooled;

Clement 2-cylinder, horizontal, 30 h. p., water-cooled; Picker 4-cylinder, vertical, 40 h. p., water-cooled; Gnome, 7 cylinder, rotating, 50 h. p., air-cooled. Mr. Bleriot has mounted a Clement 30 h. p. on my machine, but is ready to provide any of the other motors according to the preference of his customers. An experimental monoplane, designed to avoid the Wright patent, was observed under construction, but it was not sufficiently far advanced to justify description.

Another French monoplane should reach New York before long. This is one of the large and high powered Antoinettes which it is said that Mr. Harkness is taking in under bond for temporary exhibition purposes.

The death of young Hauvette-Michelin in his Antoinette at Lyons seems to have been singularly unnecessary. An eye-witness tells me that the monoplane was rolling along the ground when it knocked over the turning stake, and that Hauvette-Michelin made no attempt to dodge the stake as it fell across his craft. Many of those looking on were astonished to learn that he had even been injured by the fall of the post. The dent which the spar made in the light frame work of the aeroplane is clearly visible in a photograph.

Many of the French aeroplanes, particularly those driven by Gnome motors, carry speed indicators to show the pilots at all times the speed at which the motor is revolving. The indicator most generally in use is made by Chauvin and Arnoux. It consists of a minute magneto driven by a cord from the motor, the current from the magneto being indicated on a meter graduated in revolutions per minute, which is mounted where it may be most readily seen by the pilot.

An accomplished fellow passenger on the Majestic, after seeing the photographs of the "Flying Fish" in flight, dashed off the following amusing jingle. It evidently belongs in the advertising columns, but perhaps you will let it slip in with this letter, as being the latest word from the other side.

ADVICE.

Don't hitch your wagon to a star,
A tame and time-worn measure,
For planets and their orbits are
Too fixed for perfect pleasure.

But if, my friends, you really wish
The heavens to explore—you
Have but to try a *Flying Fish*—
The skies are all before you.

NON-STOP CROSS CHANNEL AND RETURN.

June 2.—Hon. C. S. Rolls in a Wright machine flew from Dover, England, at 6:30 P. M., across the English Channel to Sangatte, dropped three notes, and returned to Dover in 90 minutes. Large air bags were attached to lower planes.

PRINCIPAL FOREIGN FLIGHTS OF MONTH.

Cross Country Flying.

May 13.—Hauvette Michelin, at Lyons, in an Antoinette, struck in flight one of the poles marking the course. The pole snapped and struck Michelin. Picked up insensible, he died shortly afterward.

NEW PASSENGER RECORD.

May 15.—Nicholas Kinet carried a passenger for 2 hours 51 minutes on a Henry Farman machine.

Wachter flew 2 hours 2 minutes in an Antoinette.

May 16.—Roger Sommer flew across country, Mouzon to Charleville and return, 80 kiloms., in 1 hour 10 minutes.

May 17.—Illner (Etrich) flew from Wiener Neustadt to Vienna and back, 160 kiloms., in 1 hour 14 minutes.

May 19.—Count Lambert (Wright) flew from Vincennes to Gentilly with a passenger.

Cheuret (H. Farman) flew from Mourmelon to Chalons and back, 1 hour 12 minutes.

May 20.—Sommer flew from Sedan to Verdun and return, 160 kiloms., in 2 hours 10 minutes.

At Mourmelon Captain Marconnet flew 1 hour 30 minutes, and Lieutenant Fequant, 1 hour 45 minutes.

NEW TWO-MAN CROSS-COUNTRY RECORD.

May 21.—Maurice Farman with one extra passenger flew from Buc to Etampes, 80 kiloms.

CROSS-CHANNEL FLIGHT.

May 21.—Jacques de Lesseps flew over the English Channel from Calais to Dover, time 42 min. The attempt to return was abandoned. The machine used was a Bleriot XI., Gnome motor. Count de Lesseps is expected to fly at the Montreal meet, June 25 to July 4.

May 23.—Robert Frey flew over Berlin in a Farman biplane in a 35-minute flight.

May 23.—Martinet (H. Farman) flew from Chalons to Neufmoutiers, near Paris, a distance of 140 kiloms., in 1 hour 28 minutes.

May 24.—Lindpaintner (H. Farman) flew from Mourmelon to Rheims, 45 kiloms.

Maurice Farman (M. Farman) from Etampes to Toury, 30 kiloms., in 20 minutes.

May 28.—Grahame-White (H. Farman), Brooklands to Ranelagh, 24 kiloms., in 20 minutes.

Louis Paulhan (H. Farman), Verona to Solferino, 36 kiloms., in 30 minutes.

Louis Bleriot, Toury to Etampes, 30 kilometers.

A. Leblanc (Bleriot), Etampes to Toury, 30 kiloms.

May 30.—A. Leblanc (Bleriot), Toury to Chartres, 45 kiloms.

May 31.—A. Euler (Euler) made a cross-country flight from Frankfort of 115 kiloms. in 1 hour 19 minutes.

Aeronautics' Permanent :: :: Exposition :: ::

More exhibits are wanted to make AERONAUTIC'S EXPOSITION of still greater value.

Every manufacturer of anything in the flight industry should have a display for his own sake and that of the development of the Art in general

It is surprising that such an "infant industry" should be growing so rapidly that manufacturers cannot promptly fill their orders. Still, one must look ahead.

Try to scare up an exhibit for the Exposition as soon as possible and ship it along. If dire necessity calls, shipment of the display sample can be made from the Exposition.

We want to hear from every maker and urge everyone interested to call.

Exhibitors.

HARTFORD RUBBER WORKS CO., Tires.
WITTEMANN BROS., Gliders and Supplies.
WARNER INSTRUMENT CO., Aerometer.
REQUA-GIBSON CO., Motors and Propellers.
ELBRIDGE ENGINE CO., Engines.
PENNSYLVANIA RUBBER CO., Tires.
C. E. CONOVER CO., Cloth.
EDWIN LEVICK, Photos.
PHILADELPHIA AEROPLANE CO., Motors, etc.
ROEBLING CO., Wire Cable.
VICTOR L. BRUNZEL, Varnish.
EL ARCO RADIATOR CO., Radiators.
J. A. WEAVER, Wheels, etc.
WHITEHEAD MOTOR CO., Motors.
GREENE CO., Propellers and Parts.
BOSCH MAGNETO CO., Magnetos.
AUTO-AERO SUPPLY CO., Supplies.
R. I. V. Co., Ball Bearings.
J. DELTOUR, Bamboo.
J. S. BRETZ CO., Magnetos, Bowden Wire.
AERO SUPPLY CO., Supplies.
CHAS. E. DRESSLER, Model Maker.
WM. P. YOUNGS & BROS., Lumber.
BUEL H. GREEN, Turnbuckles.
PROFAC FOOD.

Club News

LOS ANGELES CLUB DEDICATES SHED.

The **Aero Club of California** held its annual picnic on May 29. This picnic was held at the motordrome, where the club now has a hangar, capable of housing sixteen machines. Eight machines are now on the ground and others building. Some eighty persons were in attendance and the affair was in every way a success. The Cannon brothers towed their big biplane behind an automobile and succeeded in leaving the ground and gliding some distance.

Mr. J. Wood Porter tried out his monoplane gliding machine, towed by an automobile, and mounted by Edgar S. Smith. The plane is circular in shape. The chassis is suspended from a central rectangle, the semi-circular wings being hinged onto this rectangle in such a manner as to allow of movement in a vertical plane like the wings of a bird. The whole surface is also hinged so as to allow the angle of incidence to be changed. The surface comprises some two hundred square feet. After running on the ground for some distance, the machine lifted slightly on one side, toppled over and became a wreck.

Three of the machines now at the hangar have engines and they will be tried out in the near future.

The Aero Club of California offered a cup to the boy making the best showing with aeroplane kites. The following boys of the Boys' Aero Club contested: Harold Scott, Carl Dorsey and John Casey with Farman models, and Edwin Gettings with a tetrahedral kite that he called a bimoplane. Mr. Gettings won the cup with a seventy-foot glide.

The hangar was dedicated by Frank C. Garbutt. Addresses were delivered by President H. LaV. Twining, Charles E. Rilliet, W. H. Leonard, Buel H. Green, William Stevens, R. I. Blakeslee.

The **Pacific Aero Club** held its second annual meeting May 11, 1910. The following officers were elected. J. C. Irvine, Pres.; I. B. Dalziel, V.-P.; C. C. Bradley, 2nd V.-P.; C. T. Shaffer, 3rd V.-P.; H. A. Chandler, Sec'y.; J. M. Masten, Treasurer; Adam Knieling, Consulting Engineer; A. S. Pare, Consulting Patent Attorney. Directors: A. S. Pare, A. L. Eisner, J. T. Stanton, Jos. Hidalgo and Jos. Rosenthal.

The membership is increasing almost daily, the weekly meetings of the club being well attended. Lectures by people of note in the aeronautical world are features.

Stuyvesant Aeronautic Society. At the annual Mechanics Arts Exhibition of Stuyvesant High School, No. 345 East 15th street, New York, held June 2, the Society exhibited eight aeroplane models. Six of these were of the monoplane and two were of the biplane type.

The Society now has seven members, whose names are as follows: Carroll E. Edson, President; C. Graham Halpine, Vice-President; Percy W. Pierce, Secretary; F. Eugene Robinson, Treasurer; Garford Oliver, Librarian; Bryan Battey, Frederick Fischer.

The **Aero Club of Jacksonville** now numbers more than sixty members. Charles K. Hamilton was recently the guest of the club at a water party. The genial treasurer, W. M. Stimson, kindly placed his handsome motor yacht at the disposal of the club, and after a pleasant trip down the St. John River, with plenty of good things provided, Hamilton was made the first honorary member.

The **Curtiss Amateur Aviation Club** has been formed in Los Angeles, with officers as follows: Ed. Gettings, president; Lawrence Adams, vice-president; Harold Scott, secretary and treasurer.

Hamilton's record, and all of Paulhan's and Farman's, were made on BOSCH-equipped aeroplanes

Ignition information for aeroplanes on request ::

Bosch Magneto Co.

223-225 W. 46th Street
New York, N. Y.

Branch Office : Detroit, Mich.
870 Woodward Avenue
Branch Office : Chicago, Ill.
1253 Michigan Avenue
Branch Office : San Francisco, Cal.
357 Van Ness Avenue

Patterns Ribs
Propellers Struts
and Special Woodwork to Your Design
Material and Workmanship Guaranteed

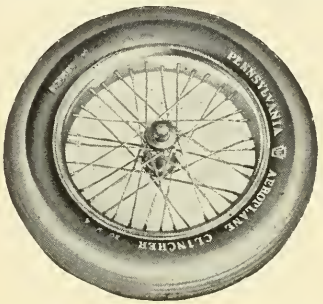
G. H. GREBE
68 Summit Street Brooklyn, N. Y.

The **Aero Club of Dayton** is anxious to have the next national convention after the one in New York, June 22, held at Dayton. Dr. L. E. Custer has been appointed to be chairman of a committee to represent the club at the convention. The Dayton Aeroplane Club has also appointed three delegates.

Dr. P. M. Crume and Dr. L. E. Custer will represent the club in the balloon race to be held at Washington, July 4th. A committee will be appointed by the club to officially observe any record flights which may be undertaken at the Wrights' Dayton school.

The **Aeronautical Society** still keeps up interest in its well attended meetings. On May 27th, President Hudson Maxim addressed the members on "Aeronautical Warfare." On June 9th, Roger B. Whitman, an expert on ignition systems, lectured on "Ignition." On May 19th another competition was held for the selection of a team to defend the Chanute Model Trophy.

AEROPLANE TIRES



Clincher type only, which is the lightest and most satisfactory type for aeroplanes

SIZE	Weight complete
20x4 in.	6¼ lbs.
26x2½ "	6½ "
28x2½ "	7½ "
28x3 "	8 "
28x3½ "	8¾ "

Wheels also furnished for the above sizes

Pennsylvania Rubber Co., Jeannette, Pa.

BRANCHES:
New York—1741 Broadway; Boston—167 Oliver Street; Chicago—1241 Michigan Avenue; San Francisco—512 Mission Street: Los Angeles—930 So. Main Street.

Aviation Revolutionized

The Latest—The Best Constructed—
The Lightest—The World Famous—

Whitehead Motor

Designed by the well-known Engineer and Motor Expert

GUSTAVE WHITEHEAD

That alone tells you what it is

No Bursting Cylinders—No Cams—
No Springs—or Valves to Work Loose

Easy Running Vibration Negligible

Absolutely Nothing to get Out of Order

Runs as smooth as an Electric Motor as long as the fuel lasts.

4 Cylinders (vertical), 8 port exhaust, 2 cycle

75 H. P.	**200 lbs.**		**Price**	**$1,400**
40 "	**145 "**	**"**		**$1,150**
25 "	**95 "**	**"**		**$950**

The Aeroplane season is now on, so order quick. Early Deliveries.

GEORGE A. LAWRENCE, Mgr.,
Astor Theatre Building, New York, N. Y.

This motor has been exclusively adopted by C.& A Wittemann, Aeroplane Manufacturers

Exchange and Forum

AIDS TO THE AERONAUTICAL ART.

Following are some pamphlets containing valuable information. In all cases, we believe, these can be obtained free by writing to the addresses given.

Some Aeronautical Experiments, by Wilbur Wright.

Aerial Navigation, by O. Chanute.

Relation of Wing Surface to Weight, by R. von Lendenfeld.

Researches and Experiments in Aerial Navigation, by S. P. Langley.

The Greatest Flying Creature, by S. P. Langley.

Experiments with the Langley Aerodrome, by S. P. Langley.

—From Smithsonian Institute, Washington, D. C.

Some Theorems on the Mechanics of High Speed Balloons, by Albert Francis Zahm, Ph. G

—From Catholic University of America, Washington.

The Resistance of the Air at Speeds Below 1000 Feet a Second, by Albert Francis Zahm, Ph. D.

—From Johns Hopkins University, Philadelphia.

Researches on the Forms and Stability of Aeroplanes, by W. R. Turnbull.

Measurement of Air Velocity and Pressure, by A. F. Zahm, Ph. D.

—From the *Physical Review,* Ithaca, N. Y.

Atmospheric Friction With Special Reference to Aeronautics, by A. F. Zahm, Ph. D.

—From the Philosophical Society of Washington.

A LETTER TO DICK FERRIS.

San Francisco, Cal., June 1, 1910.

Editor AERONAUTICS.

Dear Sir:

In a letter from Mr. Dick Ferris, published in your June issue there are certain remarks that I take exception to, and beg that you will publish this letter.

As your representative at the Los Angeles Meet it would have been decidedly unethical and improper to have taken sides in any local differences or controversies, and if you will re-read my report (March issue) you will see that this was not done, that it was unbiased, in no way misleading or derogatory, nor did it ignore Mr. Ferris, as he claims. Though he should have been given a great deal more credit for his executive ability in handling the meet. This was such a widely known fact that I, unfortunately, did not enlarge upon it further than to state that Mr. Ferris was one of the conceivers, and acted as manager.

As far as "petty jealousies" go, this charge is absolutely and obviously ridiculous, as I reside in San Francisco, am a vice president of the Pacific Aero Club, have been actively interested in and have written on the subject of aeronautics for a number of years, and our fields of activity in no way conflict.

Regretting that the fairness and impartiality, which I believe has always characterized my reports, has been questioned, and assuring both you and Mr. Ferris that no injustice was intended, or done, I am

Yours very sincerely,

CLEVE T. SHAFFER.

MOLLER AFTER GOULD PRIZE.

Referring to engines of the twin type with two propellers, for which Edwin Gould offers a prize of $15,000, we had the pleasure of seeing a new construction in a two-cycle, double acting twin engine, designed by J. A. Moller, of New Rochelle. This engine looks very feasible and ought to fill the bill for aeronautic purposes. It has a special cooling device and can be built either air or water-cooled. Mr. Moller has been studying aeronautic devices a good many years and would like the co-operation of some gentleman for the advance of the art.

PARTNER WANTED.

I have invented and applied for a patent on a gasoline motor. It is of very efficient design and only weighs 2½ pounds per horse power. It can be manufactured, I believe, cheaper than any equally good motor on the market. I need a little financial assistance to market this motor. I would like to form a partnership with some one who will put up the little cash required. Would make very liberal terms with right party. R. E. LEE, Deposit, N. Y.

NEW DEVICE FOR CONTROL.

John C. Press, of South Norwalk, Conn., has devised a system of lateral control which he says is the most ingenious, unique and effective yet brought out, and does not infringe on the Wright patent. It accomplishes, he says, the same results as the warping and tilting devices used at present without changing from the horizontal, and gives great lift without appreciably increasing head resistance, and that, as there is no turning movement, the rudder does not require to be operated in conjunction with the device.

Mr. Press is anxious to get in touch with someone to assist him in establishing his claims.

ANOTHER LETTER TO MR. FERRIS.

Los Angeles, June 5, 1910.

To the Editor of AERONAUTICS.

Sir: As to the statements made by Mr. Ferris in his letter published in the last issue of AERONAUTICS, I wish to call attention to the following misapprehensions under which Mr. Ferris seems to be laboring. The Aero Club of California came into existence some seven months before it ever heard of Mr. Ferris, and it was not through any initiative on the part of Mr. Ferris that the Aero Club was organized.

This club was organized in May, 1908, and it was in full swing in the fall of 1908 when Mr. Ferris pulled off his balloon race.

From the time of its organization this club has held continuous weekly meetings or semi-weekly meetings, and at no time in its history did it disintegrate or show any signs of disintegrating.

It applied for affiliation with the Aero Club of America six months before the international mid-winter meet was heard of, but, owing to the slowness of procedure, it did not receive the papers until the movement for the midwinter meet had been thoroughly launched.

Mr. Ferris' statements also do rank injustice to the members of the committee of the Merchants' and Manufacturers' Association, of which committee he himself was a member. If it had not been for the Merchants' and Manufacturers' Association the Los Angeles meet would never have taken place, and it was the business acumen of this committee that made the meet such a financial success.

I do not wish to detract at all from the credit due to Mr. Ferris for the energy displayed by him in bringing this meet to a head, as it would not have taken place had it not been for him also, but I do object to his misstatements with regard to the Aero Club of California and his attempt to belittle everybody else connected with the meet, and to magnify himself.

Yours very truly,

H. LAV. TWINING,
President Aero Club of California.

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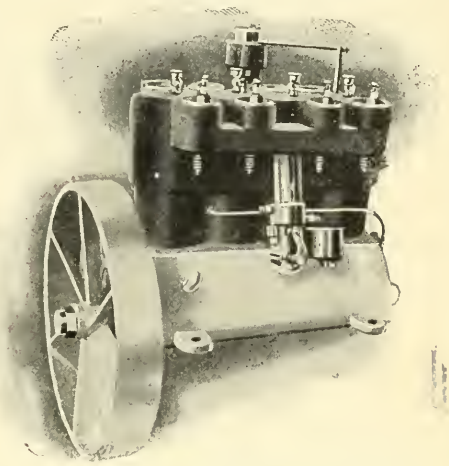

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¶ If you are in the exhibition business, if you desire to take up the selling of aeroplanes as a business, if you want an aeroplane for sport, communicate with me. A request from you for further details will convince you of the absolute correctness of these statements.

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Trade Notes

TO OUR FRIENDS.—We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

Curtiss Uses Palmer Tires.

The B. F. Goodrich Company of Akron, Ohio, has just received a letter from Mr. Glenn Curtiss, written immediately after his recent record-breaking flight along the Hudson from Albany to New York City. Speaking of his equipment in that flight, the Palmer Aeroplane Tires, which are of Goodrich manufacture, he said: "The Palmer Tires, with which I equip all of my aeroplanes, give the best of satisfaction for the purpose. The light weight does not greatly impede the lifting power of the machine, and the great resiliency enables me to land without shock on the hardest ground and to pick up speed quickly in starting. I am glad to credit a part of the success of my aeroplane to the Palmer Tire."

Mr. Curtiss used the Palmer tire on the winner of the International Aviation Cup, Rheims, France, last autumn, and on the winner of the world's record for short distance rising from the ground, at the aviation meet, Los Angeles, California, this year.

"The light weight which does not greatly impede the lifting power of the machine, and the great resiliency" which allows the plane to land without shock, were particularly important in the Albany-New York flight, when two landings were made on the way for supplies, and yet the distance was covered in phenomenal time, and with remarkable ease.

The Sacramento Aerial Co., was incorporated in April for $25,000. They are building two machines which will be done about June 10th. A lot has been leased where a factory will be erected for the manufacture of all kinds of aerial craft. It is the intention of the company to manufacture a motor which will have many improvements over anything that has been put out so far.

The Gill-Dosh aeroplane which made its debut at the Los Angeles Meet, has made over fifty short flights. This was on the Curtiss order, but had a heavy automobile motor. A new model, different from anything on the market, is nowing being made and will be flown at the St. Louis Meet for novices.

Several machines on the Coast have made short flights with the Hall-Scott motor, which is comparatively new to the aeroplane world. These are as follows: Wiseman & Peters, Farman type biplane, at Santa Rosa, Cal.; Frank Johnson, Curtiss machine at San Jose with Harold Hall as aviator, and Roy Crosby's Greene biplane with Harold Hall, rider.

Aero Motor for $250.

To fill the steadily increasing demand for a light weight aeronautical engine, the Detroit Aeroplane Co., of Detroit, Mich., has undertaken the rather difficult task to put a new motor on the market for the most popular price of $250.

This company has been incorporated under the laws of Michigan for $20,000, with F. Weinberg president, for the purpose of manufacturing aero motors and other devices. The firm of Wilcox & Carlson Co., of Detroit, makers of marine engines, has been bought out.

The engine is a two-cylinder of the double opposed type, four cycle, and has a bore of 5 in. and a stroke of 5 in., and the speed range is between 700 and 1,500 r. p. m., developing between

twenty and thirty horse power according to speed and load. The weight is 98 lbs. Both valves are placed in the cylinder head, and all four valves are operated by one single cam, in this way eliminating a large number of parts, manufacturing cost and trouble. The advantage of this arrangement is largely due to the fact that by timing one valve the others are timed at the same time. Both valves can be detached with their valve cages by loosening only two screws, at the same time giving free view of the cylinder inside and the piston. The engine being air cooled is especially designed for this purpose, inasmuch as valve sections have been employed of an enormous area, the exhaust valve, for instance, being 3¼ in. in diameter. On the other hand, the extreme large flanges have been arranged in double distance as customary practice shows. This is done to avoid the reciprocating action of the radiation from one rig to another, and has been thoroughly tested out on French and German motors.

By means of the double throw crank shaft, the pistons are forced in opposite directions, and as a result, a bright stream of air is thrown steadily inside the crank case and cylinder by each revolution, which helps considerably to bring the temperature of piston and cylinder walls down. This in connection with the arrangement of both cylinders opposite from each other, and the wide spread of the cylinder heads which are directly exposed to the cooling air draft of the propeller, warrants a most efficient cooling under propeller load.

The lubricating system is splash, and the crank case, therefore, is oil tight and from the best aluminum alloy. It contains, besides a lubricant, all moving parts of the engine, as crank shaft, timing gears, cam, connecting rods and pistons. The hollow double throw crank shaft is perfectly balanced and made from 40 to 50 pt. high carbon steel, heat treated and mounted against thrust by a New Departure ball bearing, which feature enables a direct attachment of the propeller. All other bearings are made from best white brass, and are most liberally dimensioned and replaceable. This is the strongest keynote of the motor, which is not only as light, but as durable as possible, and distinguishes itself from all other light weight engines, because it does not need the care of any expert, but can be handled most successfully by amateurs.

Connecting rods and pistons are being weighed thoroughly, and this in connection with the balanced crank shaft is a most satisfactory running system. There are some other points of refinement employed in the design, one of which is that all the strain of the cylinder and crank case is converted into compression instead of pulling stress.

The gasoline tank may be mounted in or above height of the engine, as the carburetor is attached to motor on its lowest point of the crank case, forming with the latter a compact unit. The crank case itself is provided with flanges for the purpose of fastening to the frame of the aeroplane.

The design, in connection with the very best material used, and the very best workmanship obtainable, warrants a first class product. This, in connection with a large output and in always keeping a number of ready tested engines in stock, enables the company to market this motor for only $250. This price includes the ignition system, consisting in snaptimer provision being made for attachment of magneto.

Propellers are made and attached to motors on special request, and are kept in stock in sizes between 5 and 8 ft. diameter and 3 to 7 ft. pitch, these propellers being the sizes which the motor is able to pull successfully without overheating or destructive effect.

Catalogs are sent on special request. The company asserts that the price is so low that even the most modest aeroplane manufacturer can obtain a powerful engine at a reasonable price.

Wittemann Catalog.

C. & A. Wittemann, Stapleton, Staten Island, N. Y., have gotten out quite the finest aeronautical catalog yet issued anywhere. It contains a full list, illustrated, of parts, gliders, wheels, etc., and the Whitehead engine.

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For the purpose of increasing the sphere of usefulness the membership should be augmented. Every additional member advances the general good.

¶ Address the Secretary for booklet and application blanks at P. O. Box 28, Station D, New York; or 1999 Broadway, where weekly meetings are held.

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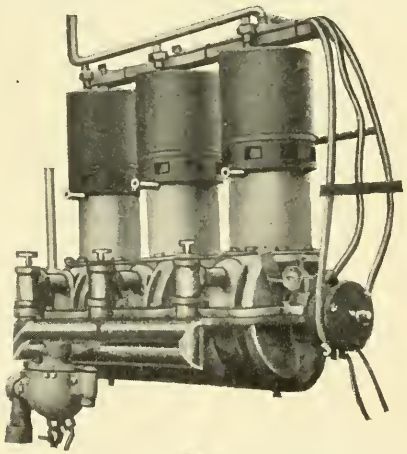

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Propeller Tests Well.

A test of a propeller, the design of which is new, made by the Requa-Gibson Company, was made at the Curtiss place in Hammondsport on June 4. Hugo C. Gibson had gone to the factory of the Elbridge Engine Co., at Rochester, to make tests of the propellers on the Elbridge engines. Six propellers were taken, one of which was of the new type. Owing to the rush of business, there was but one of the large engines available, and that had been delivered to Glenn H. Curtiss. So the tests had to be made at Hammondsport. The engine was hung in a frame snspended from the ceiling, and on a spring balance attached to the wall the thrust was read. The 7-ft. diam., 4-ft. pitch special propeller showed up 337 lbs. at 860 r. p. m., the engine developing at the time 26 h. p. With the balance of the power of the motor to draw on, the new propeller should show great speed possibilities and economy in gas consumption.

Fred Shneider Busy.

Three more aeroplanes, combination Farman and Voison types, will be delivered by the end of the month. One will be equipped with a 3-cylinder, 30-35 h. p., and the others with 4-cylinder, 40-160 h. p. Elbridge motors. One is for one Castellano, who used to loop the loop on a bicycle; one is for Nicholas Rippenbein, of Perth Amboy, and the third is for Mr. Shneider himself, if someone doesn't buy it in the meantime, to try out some new devices.

Manufacturers Please Note.

A. H. Hofer, 2035 Michigan avenue, Chicago, Ill., would like to get catalogues of all aeronautic supplies. He expects to construct a biplane of about the same dimensions as the Curtiss.

Many Aeroplanes Sold in Washington State.

The Hamilton Aero Mfg. Co., of Seattle, Wash., have built and sold six machines, including several biplanes, and are now building two biplanes for the international meet, to be equipped with an Elbridge 40-60 h. p. motor and a Requa-Gibson propeller. They already have seven orders for "Dumonoplanes" and biplanes. Many orders are turned away because they cannot make immediate delivery.

The Whitehead Motor.

The first aeroplane to be fitted with a Whitehead motor is that of Chas. W. Miller. Following are the details of the motor:

The engine is highly finished and has specially tempered steel cylinders with steel water jackets welded in place. Under hydraulic pressure the jackets stand a pressure of 600 lbs. to the sq. in. Forced circulation is maintained at high speed by a gear pump.

The engine is of the two-cycle type, with eight port exhausts to each cylinder. No carburetors are used, a special Whitehead vaporizer being provided for each cylinder. Ignition is Bosch magneto.

The intake is automatic, and is through a valve located in the center of the piston head. The crank case is divided into four compartments, which serve as pre-compression chambers, and in which the gas is compressed to 20 pounds per square inch, previous to being admitted into the explosion chamber.

When the exhaust takes place, the relief of the pressure in the explosion chamber enables the lower pressure in the crank case to force the valve open, admitting the new charge into the explosion chamber, coincident with the escape of the dead gases through the exhaust ports.

On the upward stroke a compression of 95 lbs. is reached, which is considerably in excess of that of any other motor, resulting in increased power. The exploding charge is at 300 lbs. per sq. in.

The bore is 5 in. and the stroke 5½ in., making it a low speed, high powered engine.

The cranks are set at quarter turns, making vibration almost negligible. Being a two-cycle type, the power is increased over a four-cycle engine of the same bore and stroke, there being four explosions for each revolution of the crank shaft, as compared with two explosions in the four-cycle type.

Thus a four-cylinder, two-cycle engine, such as the Whitehead, is theoretically much more flexible than a six-cylinder, four-cycle automobile engine, and is equal in flexibility to an eight-cylinder, four-cycle engine.

The oiling system is both by splash lubrication and mechanical oiler. The bearings are five in number, of phosphor-bronze. There is also a thrust bearing on the crank shaft to prevent the breaking of the crank case from the pressure of the propeller.

The construction of the cylinders of the Whitehead engine is unusual, as they are bored out of a solid billet of chrome nickel steel and subjected to numerous temperings.

The steel sheet water jackets are welded in place by the oxo-acetylene process, so that there is no danger of a break in the water-cooling system. There is in the Whitehead engine no packing whatever, and all its working parts are of the utmost simplicity.

The crank case is of aluminum alloy, and the cylinder bolts run all the way through the crank case, thus giving much more than the usual solidity of construction.

Incorporations

Newell Aerial Navigation Company of Seattle, $100,000; Frank A. Newell, R. McA. Redpath, John H. Casebier, Carl J. Lindquist and William V. Osborne.

Western Aeroplane Exhibiting Company; Harry B. Snell, R. W. Lawson, Frank J. Boot, Jr., Harold S. Boot, Alva A. Ingersoll; $50,000; Denver.

The Twin City Aviation & Exhibition Co. has filed articles of incorporation with the Secretary of State; capital $50,000. The incorporators are L. N. Scott and William J. Murphy of St. Paul; H. E. Pence, J. J. Barclay, W. E. Wheeler, A. W. Strong, H. E. Wilcox, L. H. Fawkes and F. E. Murphy of Minneapolis.

Marquette Aeroplane Co., Indianapolis, Ind., $10,000.

Portland Aeroplane Co.; principal office, Portland; capital stock, $5,000; incorporators, Frank Bettmann, Arthur Langguth and P. A. Taylor.

Patent List

NOTE:—IN THE FUTURE ALL PATENTS LISTED WILL SHOW DATE OF FILING AS WELL AS DATE OF ISSUE, IN RESPONSE TO THE SUGGESTION OF A SUBSCRIBER.

Igo Etrich and Franz Wels, Oberalstadt near Trautenau, Austria-Hungary, 952,317, March 15, FLYING MACHINE. The invention consists of an aeroplane wing having a forward convex curved edge and rear concave edge and rounded end portions, while at bottom of the plane the front is concave and rear convex.

Rudolph G. Dressler, Coney Island, N. Y., 952,886, March 22, AMUSEMENT FLYING MACHINE. Two posts spaced apart and flexible rope extending across at the top and bottom with rotating drum to operate the rope and a toy flying machine attached to the rope at the top so as to be moved in imitation of flight from one post to the other.

Daniel C. Funcheon, Denver, Colo., 953,198, March 29, FLYING MACHINE. This invention consists in supporting a car by means of kites flexibly connected thereto. Propellers are provided at the sides and rear of the car to control direction and the rear propeller is movable vertically on its bearings so as to raise or lower the apparatus.

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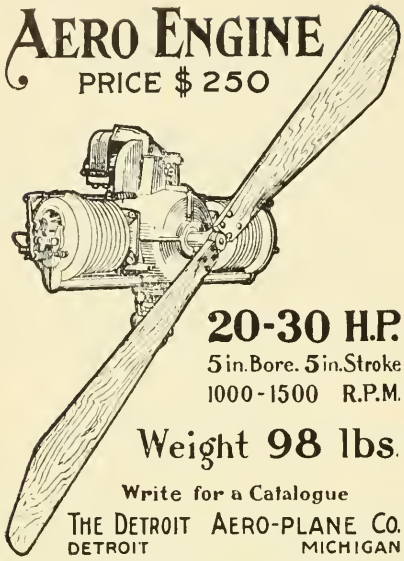

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Johannes Schilling, Colonie Grunewald, near Berlin, Germany, 954,215, April 5, 1910, filed June 2, 1909. BALLOONS. This invention relates to a method of insulating balloons, more particularly dirigible balloons, by providing a jacket around the gas chamber and filling said chamber with an inert gas, that is a gaseous fluid freed from oxygen such as the exhaust gases from a motor.

Edward J. Augsberger, Philadelphia, Pa., 953,810, April 5, 1910, filed April 8, 1909. FLYING MACHINE consisting of an aeroplane (of any type) proved with front and rear planes at the sides of the main plane or planes. These side planes are inclined from the horizontal, the front planes inclining upwardly from the inner to the outer ends and the rear planes inclining in the opposite direction.

Albert Koegler, San Francisco, Cal., and Kamillo Stelzer, Jr., Dresden, Germany, 954,574, April 12, 1910, filed March 3, 1908. MEANS FOR STEERING FLYING MACHINE. This invention contemplates a supporting frame, above the basket or chassis, for a motor hung in a universal joint. Above the motor extends a sleeve and inner shaft caused to rotate in opposite directions, by means of bevel gears, and air vanes are secured to each. By changing the angle of inclination of the motor and air vanes, the apparatus may be steered in any direction.

Anna O. Hagstedt, New York, N. Y., 954,733, April 12, 1910, filed Feb. 18, 1909. FLYING MACHINE consisting of a body having two motors described as a main and auxiliary motor. Propelling means comprising front and rear propellers in addition to supporting means in the form of a plurality of flapping wings are operatively connected to both motors.

Gustave H. Brekke, Seattle, Wash., 955,049, April 12, 1910, filed May 16, 1908, renewed, Nov. 10, 1909. AIRSHIP comprising specifically a helicopter construction of oppositely rotated propellers supported on vertical shafts, one within the other, and means for swinging the propellers to and from an inclined position. The upper end of shafts being broken and provided with universal joints.

Lagar R. Culver, Salt Lake City, Utah, 955,389, April 19, 1910, filed May 5, 1908. AEROPLANE, the novelty of which lies in a kite-shaped frame supported on a wheeled chassis. The frame is integral with the planes and is pivoted at the front corners so that each side may be raised or lowered independently. The tail is similarly pivoted and hand levers are connected for manual operation.

Nikolas Rueben, Aix la Chapelle, Germany, 956,428, April 26, 1910, filed Sept. 1, 1909. AIRSHIP HALL with temporarily removable roof. A hangar consisting of gable side walls and pillars and rafters constructed to swing on said walls to vertical position, the rafters being divided in the middle to form a slanting roof when in normal position. The roof covering is slidingly arranged on the rafters and movable in divisions.

Henry C. Schanze, Sr., Camden, N. J., 956,648, May 3, 1910, filed Nov. 25, 1908. DEVICE FOR AERIAL NAVIGATION. A housing provided with propellers above and at each end, the former rotating on vertical shafts and the latter on horizontal shafts. Quadrants are secured at the ends of housing for supporting the horizontal shafts and means are provided for quadrants and propellers for the purpose of steering.

Rudolph Gendts, New York, N. Y., 957,205, May 10, 1910, filed April 29, 1909. AIRSHIP. A rigid cigar-shaped gas balloon provided with compartments separate from the gas. An open air compartment at the top serves as a passenger car. Below this a compartment houses the power plant which through transmission gears operate vertical and horizontal propellers. Double rudder blades are provided at the rear on each side of envelope connected together by rods and operable simultaneously by transmission to a steering wheel in passenger car compartment.

William W. Christmas, Washington, D. C., assignor of 49,100 to Creed M. Fulton and Thomas W. Buckey, Washington, D. C., and Lester C. McLeod, Astoria, Ore., 957,744, May 10, 1910, filed Oct. 30, 1909. FLYING MACHINE. An aeroplane consisting of a plurality of separate, inde-

pendent, suitably spaced supporting planes of concave-convex form in the direction of their length, transversely to the line of flight, the concave sides being towards each other. The upper supporting plane has also an intermediate air gap and is warped to present air guiding surfaces leading to said gap.

Louis Arnheiter, Jersey City, N. J., 958,460, May 17, 1910, filed Oct. 6, 1908. AIRSHIP. An aeroplane having the following characteristics: A frame-work on wheels supports in the center a large sustaining surface of arch shape open at the front, rear and bottom. Located at each side of main surface a smaller surface of same style is provided. Within the large arch adjustable propellers serve to propel forward or backward while under the side arches a propeller at each side raises or lowers.

John Hoskine, Detroit, Mich., 958,747, May 24, 1910, filed June 14, 1909. FLYING MACHINE, comprising aeroplane surfaces and a helicopter above them so arranged that upon a rapid downward movement the spaces between the blades are automatically closed and an outwardly and downwardly extending rim surrounding the helicopter enables it to act as a parachute.

Frederic W. Schroeder, Kennington, London, England, 959,266, May 24, 1910, filed Nov. 4, 1909. AERIAL SHIP. A combination of helicopter, gas bag, lifting vanes and parachute. A series of lifting propellers arranged in pairs on vertical axes to rotate in opposite directions are connected with auxiliary lifting vanes lying below and across the main blades of the propellers. Vertically disposed gas bags are carried below the frame and above a series of parachutes are arranged normally collapsed and adapted to expand automatically when any downward velocity is acquired.

Marcel Kapferer, Billancourt, France. Assignor to Societe Aronyme "Astra," Billancourt, France, 958,926, May 24, 1910, filed Sept. 11, 1909. DEVICE FOR FEEDING BALLOONETS ON AIRSHIPS, comprising a pipe within which is a flexible partition running longitudinally and being of a width equal to half the circumferential development of the pipe. A flexible spherical cap, attached to the partition, is operable from the outside for the purpose of directing the gas into one or other of the compartments to be supplied.

John Buchanan, Holland, Mich., 959,199, May 24, 1910, filed Oct. 9, 1908. FLYING MACHINE. An aeroplane provided with propeller at the front and rudder at the rear with a car pivotally suspended below and means for adjusting manually the angular relation of the car and planes.

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:: :: Two 400-Mile Trips :: ::

:: :: One of 200 Miles :: ::

Forbes' New Record Altitude.

NOTE: ASTERISK (*) DENOTES TRIP OVER 100 MILES.

*Quincy, Ill., May 9.—A Holland Forbes, pilot, in his new balloon "Viking," with J. C. Yates, to Crail Hope, Ky., a distance of 363¼ miles; duration 19 hours 55 minutes, highest altitude, 20,600 ft.

The trip was undertaken with a view of gaining the record duration, altitude and distance, but the poor quality of the gas cut down the supply of sand bags. When the aeronauts landed there was but one bag left out of the thirty-three at the start.

From 6:50 p. m., the time of the start, till 9:00 the next morning, but six bags were used. In passing over Illinois, the balloon suddenly dropped from an altitude of 8,000 or 9,000 ft. and six bags of sand were used to check this sudden descent, which was accomplished just as the trail rope touched the ground. It was found out afterward that a local rain storm probably created a rising column of cold air and caused the drop.

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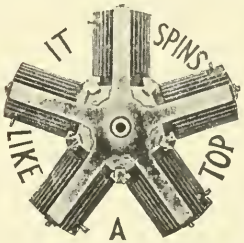

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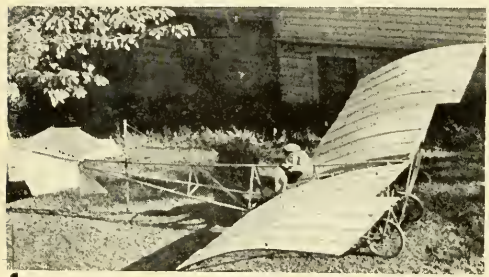

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Considerable ballast was expended in attaining the great altitude. The aneroid was examined at about 2:00 o'clock, and it registered 20,600 ft. At this point the aeronauts were gasping for breath, and this height was maintained for about ten or fifteen minutes. It is supposed the balloon went considerably higher. The instrument was later examined by the makers and it was found that this height was the limit of the capacity of the aneroid.

The gas left only slightly filled the balloon, and as it tended to collapse, it had a corresponding tendency to elongate, hence the pressure upon the rope extending from the base of the appendix to the basket became great. In fact almost the entire weight of the rigging beneath the balloon was forced upon this single line, and at length it parted. This dropped the basket, elongating the balloon so suddenly that the line from the ripping panel to the basket became suddenly taut, tore open the ripping panel four or five feet. The gas rushed out at terrific speed. The result was the immediate collapse of the balloon and its descent to the ground at 2:45 p. m. At this time the 350-ft. trail rope was just touching the ground.

The aeronauts were found unconscious by farmers. Forbes was laid in a lot of poisin ivy vines and suffered from their poison for some days.

Pittsfield, May 11.—Charles J. Glidden, pilot; Rabbi Charles Fleischer and J. J. Van Valkenburgh in the "Pittsfield," to Holden, Mass. Duration 3 hours; distance 75 miles; altitude 5,400 ft.

Pittsfield, May 14.—Charles J. Glidden, pilot, and Jason S. Bailey, in the "Mass.," to Berkshire, Mass. Duration 1 hour 45 minutes; distance 65 miles; altitude 8,700 ft. Snow storm at 4,000 to 8,000 ft. 1 hr. 40 min.

Philadelphia, May 14.—Dr. Thomas E. Eldridge, Ira Brown and Mrs. D. V. Evans, in the "Phila. II.," to Williamstown, N. J. Distance 20 miles; duration 5 hours; altitude 9,000 ft.

Pittsfield, May 15.—William Van Sleet, pilot; Roswell C. Tripp, Fairman Dick and E. C. Ely, in the "Springfield," to Sharon, Conn. Distance 75 miles; duration 5 hours; altitude 7,000 ft.

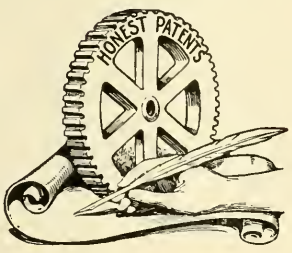
St. Louis, May 19.—John Berry, pilot; Prof. G. O. James and Andrew Drew, in the "St. Louis III," at 6:35 p. m., to Carsonville at 7:15 p. m. At 8:30 p. m. another ascent was made from here, landing eventually at 11:20 near Hillview, Ill. Hillview cannot be found on the map.

CROSSES LAKE MICHIGAN IN NIGHT TRIP.

*St. Louis, May 19.—H. E. Honeywell and William F. Assmann left St. Louis in the "Centennial" to make a new distance record. After being in the air 22 hours and traveling 409 1-3 miles, a landing was made at Shiloh, Mich. An altitude of 14,800 ft. was reached.

*North Adams, May 20.—A. Leo Stevens, pilot; Dr. David Todd, Percy Sherman and Charles Somerville, in the "Cleveland," to St. Dominique, Que., in the longest flight ever made from a New England point. Duration 11 hours 52 minutes; distance 219 miles; altitude 11,000 ft.

"A TALK TO THE INVENTOR"



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WINS THREE CUPS.

The pilot, Mr. Stevens, wins for the first time, until his record is beaten, three cups:

"La Patrie Montreal," to the pilot landing nearest the office of "La Patrie."

"Cortlandt F. Bishop," to the pilot making the longest flight in 1910, starting from a point in New England.

The "North Adams Cup," for the longest distance made from North Adams.

A lower current was encountered which began to drive the balloon towards the States again, and it was thought best to land at Drummondsville. The trail rope was dropped here and the aeronaut called out to a farmer to catch it, but the man's wife held him back. By this time the balloon had come up to a forest where it was impossible to descend, so the trip had to be continued some seven miles further on the return journey. The final landing was made at St. Dominique, Que.

The Automobile Club of Canada's cup for a landing on the island of Montreal does not appear to have been won, as St. Dominique is not on the island.

London, England, May 20.—H. W. Gannett, of the N. E. A. C., made a trip over London and landing at Castle Abbey. Distance 60 miles.

The funeral of King Edward was viewed from the balloon.

Pittsfield, May 21.—William F. Whitehouse, to near Springfield, Mass., in the "Pittsfield." Distance 40 miles. 2 hrs.

Philadelphia, May 21.—Dr. George H. Simmerman, Dr. Thomas E Eldridge, Prof. Charles L. Doolittle and A. L. Millard, in the "Phila. II.," to Crestmoor, N. J.

Crestmoor cannot be found on the map. Though the balloon was sent up 6,500 ft., on account of the dense clouds, no view of the comet was obtained.

Indianapolis, May 27.—G. L. Bumbaugh and Dr. L. E. Custer, from the Motor Speedway, landing about 10 miles away.

Indianapolis, May 28.—Luzern Custer and C. A. Coey, from the Speedway to Eagletown, about 25 miles.

Pittsfield, Mass., May 27.—J. Walter Flagg, pilot, and W. G. Kelly, in the "Pittsfield," to Springfield, Mass. Duration 2 hours; distance 62 miles. 697 miles

Pittsfield, May 28.—Charles J. Glidden, pilot, and Jason S. Bailey, in the "Mass," to Bethany, Conn. Duration 2¾ hours; distance 75 miles; altitude 7,700 ft.

Springfield, May 28.—Jay B. Benton, pilot; Louis Dederick, Prof. David Todd, Robert Wells and Nelson Waite, left the ground in the "Springfield" but the balloon caught in the wires lining the railroad and the gas had to be let out and the trip abandoned.

St. Louis, June 12.—S. L. Von Phul, pilot, and J. D. W. Lambert, in the "St. Louis III.," to North St. Louis. In descending it was found the rip and valve cords were entangled and the balloon was allowed to drop of itself. The descent was in the Mississippi River.

Warner Carroll

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"Aeronautics" New Year.

It is with somewhat more assurance of the ultimate than on three previous Julys that with this issue "Aeronautics" begins its fourth year.

Aeronautical affairs of late have reached a higher plane and the structure of the Art is attached more firmly to the industrial chassis.

In the face of the kindly advice of those foremost on the subject the magazine was started in July, 1907, when a gas balloon was a curiosity and the Wright Brothers' flights were still alleged myths.

With the good will and ready support of these somewhat pessimistic friends, and with the appreciation of those who found "Aeronautics" of interest and value, without a skip the magazine was continued single-handed through three not particularly encouraging years.

It was steep-angle work, you may be sure. No time or pains has ever been spared to make the paper as reliable, accurate and efficient as possible in its heretofore exceedingly limited field. The sun often set and rose again on a day's work, but the heart was in it, and this, perhaps, made the labor lighter.

In launching upon this New Year I want to express my sincere appreciation of the many kindnesses thrust upon the magazine, and may success eventually alight at our doorsteps.

ERNEST L. JONES.

Automatic Stability Problem Solved.

Longitudinal and lateral stability form the two most important problems in the development of the aeroplane. Stability must eventually be automatic.

For some years past Lieutenant J. W. Dunne who was for some time attached to the Balloon Factory at Farnborough, England, but has recently continued his experiments at Sheppey on his own account, has worked at the problem. A biplane designed by him, and piloted by Lieut. Gibbs, actually made several flights in Perthshire in the autumn of 1908. Since the beginning of this year flights extending in one case to nearly one mile have been made in the Isle of Sheppey. The machine was recently reconstructed, and was brought out once again and tried on the afternoon of May 27, in a fair breeze. Lieut. Dunne, who piloted the biplane, arose from the ground after a run of some forty yards and, rising to sixty feet, maintained this altitude for some distance, when he let go his grasp of all the steering-levers and absolutely abandoned the machine to the air. Pursuing its free flight with perfect stability and steadiness, the aeroplane covered a distance of just on two miles, when Lieut. Dunne resumed control of his levers in order to clear a high mound, but, being unable to do so, came to earth in a ploughed field. The entire length of the flight was about two and one-half miles. During its free flight the aeroplane gradually rose all the while.

The importance of this achievement need not be insisted upon, it simply proves that the problem of automatic stability is in a fair way of being solved, and as such its significance transcends that of the majority of sensational sporting and exhibition flights. During the whole of its free uncontrolled flight the aeroplane remained absolutely stable. The aeroplane is a biplane; the wings project backwards from the central axis of the machine, and in plan have the shape of a V with the apex in the direction of flight; the wing tips are actually situated in rear of the center of gravity of the machine. Their combined area i 560 square feet. The machine carries no tail no steering or controlling surfaces of any kind with the exception of a flap hinged to the rear extremity of each wing for effecting horizontal and vertical steering. A 4-cylinder, 50 H. P. "Green" engine drives two propellers revolving at the rear of the surfaces. The wings have a positive angle of incidence near the centre, the angle gradually decreasing towards the tips, where the angle i actually negative. The machine weighs 1,700 pounds, the load therefore being about three pound per square foot.

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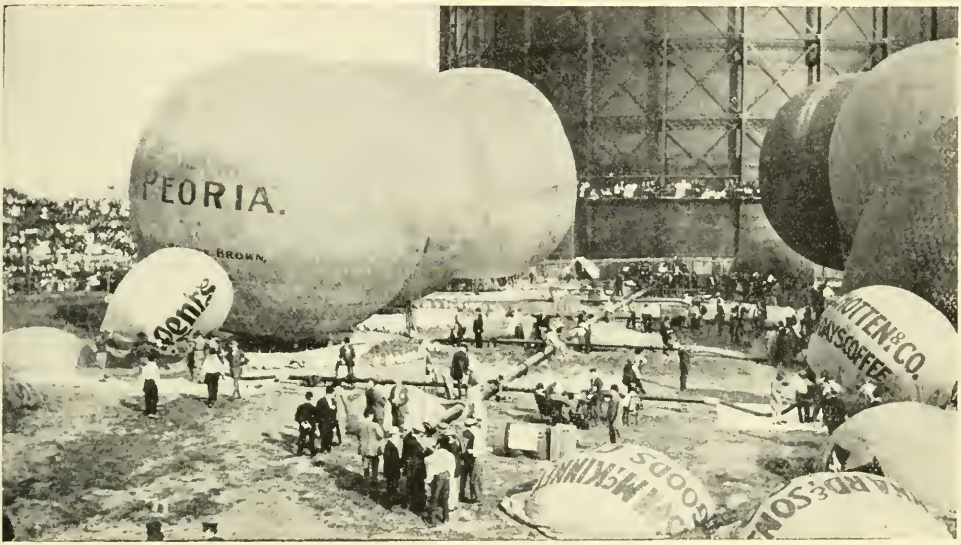
PEORIA CONTEST — Balloon "Peoria" — 3 competitors
ST. LOUIS CENTENNIAL CONTEST — Balloon "St. Louis III" first, and Balloon "Centennial" officially second for distance and endurance, 47 hrs., 41 min.—8 competitors
Balloon "St. Louis III"—speed record of America—Lambert, pilot; Von Phul, aide
JUST THINK OF IT, EVERY CONTEST IN THE LAST TWO YEARS.



Aero Club Grounds, Centennial Contest, St. Louis, Mo .

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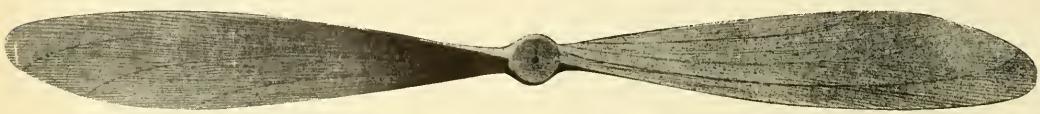

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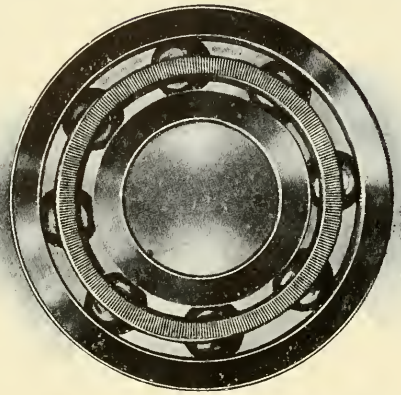

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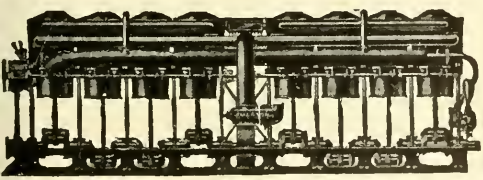

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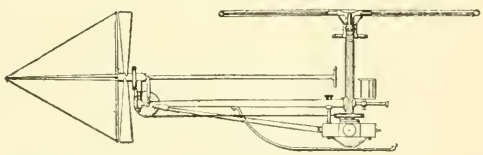

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¶ In response to a persistent demand we have inaugurated a new department. We will build complete machines in our own shops to your specifications. Full size or models with or without our special advisory service.

FACTS

¶ The ***Aeronautic Supply Company***, organized last year, is the first concern of the kind in all America.

¶ Our catalog is now running in the third edition. Bulletin number three very complete and especially valuable, now off the press.

¶ If you are not already in correspondence with us, write now. We help.

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General Office:
302 N. 12th STREET

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First in all America

Scientific American Trophy, 1907

How Competition Promotes Progress

FOR the third time America's first aviation trophy, which commemorates Langley's aeroplane, has been competed for and perhaps permanently won

by GLENN H. CURTISS

in his record-breaking flight down the Hudson River, on May 29th. On July 4th, 1908, he flew a mile in a straight line; last year he covered 25 miles over a circular course; and now he has flown 74¼ miles from ALBANY to POUGHKEEPSIE without a stop at a speed of over 50 miles an hour—a long distance flight already increased materially by ***Chas. K. Hamilton*** in his 1 hour and 50 minute trip from GOVERNOR'S ISLAND to PHILADELPHIA on June 13th.

¶ All this shows what progress has been made since we offered the ***Scientific American Trophy.*** The competitions this year which are to be cross-country flights—will evidently be very keen; and aviators intending to compete should make entry early.

FOR FULL PARTICULARS AND RULES ADDRESS

The Scientific American 361 BROADWAY NEW YORK

BALDWIN'S
Vulcanized Proof Material

WINS

LAHM BALLOON CUP—697 Miles
Forbes and Fleischman, Balloon "New York"

BEST DURATION INDIANAPOLIS BALLOON RACE—
35 Hrs., 12 Mins. Forbes and Harmon, Balloon "New York"

U. S. BALLOON DURATION RECORD—48 Hrs., 26 Mins.
Harmon and Post, Balloon "New York," St. Louis Centennial

U. S. BALLOON ALTITUDE RECORD—24,200 Ft.
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GORDON BENNETT AVIATION PRIZE
30-KILOM. AEROPLANE SPEED PRIZE
GRAND PRIZE OF BRESCIA FOR AEROPLANES
QUICK STARTING EVENT AT BRESCIA
2nd, 10-KILOM. AEROPLANE SPEED PRIZE
2nd, BRESCIA HEIGHT PRIZE—Glenn H. Curtiss

BALDWIN'S VULCANIZED PROOF MATERIAL

Used in the U. S. Gov. Dirigible and Spherical Balloons

WILL last from five to six times as long as a varnished balloon. The weight is always the same, as it does not require further treatment. Heat and cold have no effect on it, and ascensions can be made as well at zero weather as in the summer time. The chemical action of oxygen has not the same detrimental effect on it as it has on a varnished material. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the strength of varnished material. A man can take care of his PROOF balloon, as it requires little or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 lbs. per inch width. Very elastic. Any weight, width, or color. Will not crack. Waterproof. No talcum powder. No revarnishing. The coming balloon material, and which through its superior qualities, and being an absolute gas holder is bound to take the place of varnished material. The man that wants to have the up-to-date balloon, must use VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

AEROPLANE MATERIAL A SPECIALTY

Prices and samples on application

Captain Thomas S. Baldwin

Box 78, Madison Square

NEW YORK

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AT MONEY SAVING PRICES

Elbridge Special Feather-weight, 2-Cycle Aero Motors (water cooled):
3 Cylinder, 30-45 H. P., 138 1-2 lbs. . $750.00
4 Cylinder, 40-60 H. P., 178 lbs. . . . 1050.00
Cylinders 4 5-8 x 4 1-2, copper jackets, aluminum bases, hollow crank shaft.
4 Cylinder, 20-24 H. P., 150 lbs. (air cooled) 610.00
Cylinders 3 1-2 x 3 1-2, flanges 1 5-8 in. deep.

20 x 2 Aeroplane Wheels with tires built with steel rims and special hub, very strong, price, . . 9.50

E. J. W. Aeroplane Hubs turned from solid bar of steel, drilled 36 holes, well-nickeled, . . . 4.00

E. J. W. Aeroplane Hub Brakes, enables aviator to stop his plane before or after alighting on ground, length 8 ins., outside cones 5 3-4 ins., bored 36 holes 10.50

Requa-Gibson Propellors, laminated wood, perfect screw:
6 ft., 6 1-2 lbs. 50.00
7 ft., 9 lbs. 60.00
8 ft., 12 lbs. 70.00
The 6 ft. propeller gives 200 lbs. thrust at 1200 R. P. M.

Model Propellors, laminated wood, 10 in. to 15 in. perfect screw, ... 5.00

Galvanized Steel Cable for "Guying":
1-32 in., 200 breaking strength, price per ft. .03
1-16 in., 500 breaking strength, price per ft. .03½
3-32 in., 800 breaking strength, price per ft. .04
1-8 in., 2300 breaking strength, price per ft. .06

Rubber Bands for models, 15 ft. lengths, 1-8 in. square, each, ... 1.00

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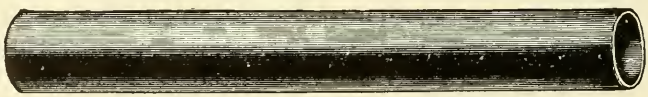

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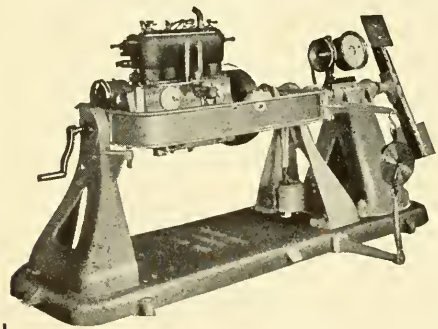

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Good Workmanship

OUR AEROPLANES

stand on skids, run on skids,
get into the air on skids,
alight on skids, and are

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They are made by craftsmen, trained to careful work for many years on racing boats Our men know why and how

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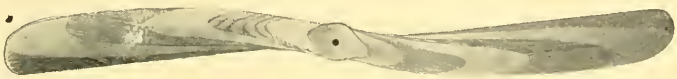
OUR true pitch, laminated ash and mahogany propellers combine all the most valued and proven features of foreign and home practice.

THEY are built in large quantities on the interchangeable plan.

WE specialize. You get the benefit of our experience.

YOU know the value of buying a stock article, one which is past the experimental stage.



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6 ft. dia. for 20-30 H. P. (Thrust 200 lbs. @ 1,200 R. P. M.)	$50.00 at our Works	Larger sizes to order
7 ft. dia. for 25-40 H. P. (Thrust 250 lbs. @ 1,200 R. P. M.)	$60.00 at our Works	
8 ft. dia. for 30-60 H. P. (Thrust 300 lbs. @ 1,200 R. P. M.)	$70.00 at our Works	

BULLETIN Our latest design "SPECIAL" 7-foot propeller tested at the Curtiss Factory, Hammondsport, N. Y., fitted to an "ELBRIDGE" engine, gave a thrust of 337 lbs. with great economy of gasoline.
——This means increased aeroplane speed and range of action——

Small propellers for Models 10-16" dia., $5.00
Mail or telegraph 10% of amount and we will ship C.O.D. for balance, plus cratage.

When ordering state the direction of rotation of propeller when you stand facing the breeze made by the propeller, clockwise or anticlockwise?
If uncertain as to the size you require, state the horsepower of your engine and its speed.

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Call Aviation Engine

"THE MAGNALIUM ENGINE"

Aviators, Attention!

A Timely Word About Motors

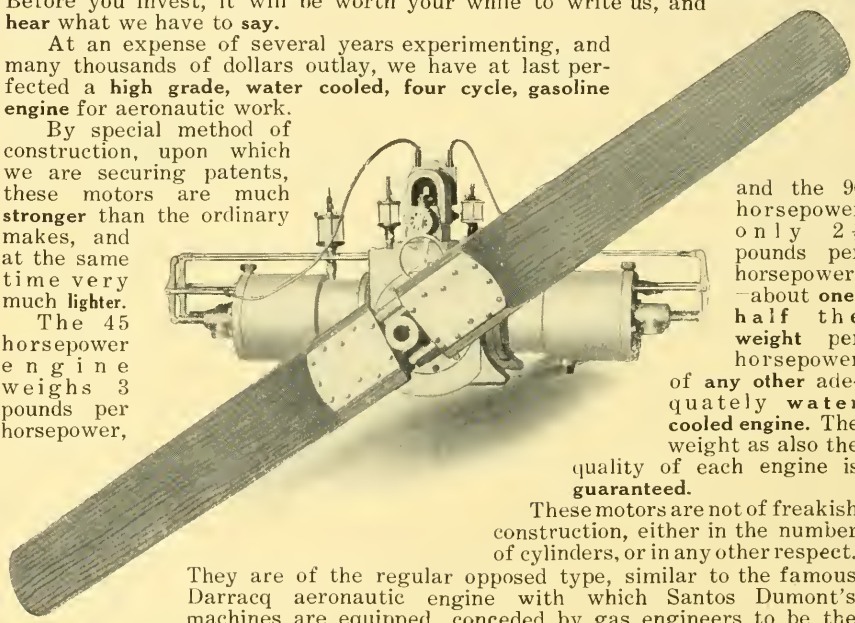
What you want is **A Real Aeronautic Motor,** light and yet strong, simple, and above all **reliable.** A motor, moreover, that the average mechanic can understand and operate.

What you do not want is a combination motor cycle, or modified automobile, engine. Lightness in these is secured only by the sacrifice of strength and efficiency; yet either type is unduly heavy. We have tried both and we **know.** Before you invest, it will be worth your while to write us, and **hear** what we have to **say.**

At an expense of several years experimenting, and many thousands of dollars outlay, we have at last perfected a **high grade, water cooled, four cycle, gasoline engine** for aeronautic work.

By special method of construction, upon which we are securing patents, these motors are much **stronger** than the ordinary makes, and at the same time very much **lighter.**

The 45 horsepower engine weighs 3 pounds per horsepower,



and the 90 horsepower only 2½ pounds per horsepower:—about **one-half the weight** per horsepower of **any other** adequately **water cooled engine.** The weight as also the quality of each engine is **guaranteed.**

These motors are not of freakish construction, either in the number of cylinders, or in any other respect. They are of the regular opposed type, similar to the famous Darracq aeronautic engine with which Santos Dumont's machines are equipped, conceded by gas engineers to be the **smoothest running,** and nearest **vibrationless** type.

A scarcely less important feature is the fact that our motors are silenced (not muffled), which feature is secured without loss of power. They are in fact, the **only silent motors** yet devised for aeronautic work. The importance of this feature can not be overestimated; and in connection with their **strength, lightness,** and **reliability,** places these motors in a **class by themselves.**

MODEL E-1: Two Cylinder, 45 Horsepower; Weight, 135 pounds. Price, $700.

MODEL E-2: Four Cylinder, 90-Horsepower; Weight, 225 pounds. Price, $1,200.

EXTRA—Bosch Magnetic Ignition: Model E-1, $50; Model E-2, $100.

TERMS: 40 per cent. cash, with order. Balance Sight Draft against Bill of Lading.

Write to us and let us send you Illustrations and description of these Wonderful Motors.

P. S.—Send for particulars and price of our REVERSIBLE AERIAL PROPELLER. Something entirely new and absolutely indispensable.

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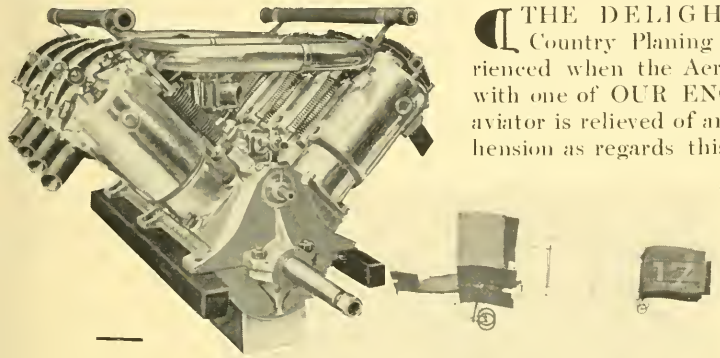
AEROPLANE ENGINES

ADAPTABLE ALSO FOR USE IN THE DRIVING OF

Dirigible Balloons and High Speed Motor Boats



¶ THE DELIGHTS of Cross-Country Planing are fully experienced when the Aeroplane is fitted with one of OUR ENGINES, as the aviator is relieved of any or all apprehension as regards this power plant.

TYPE B-3

60 H.P., Eight Cylinders, mounted "V" shape with a 90° relation to each other. Weight, 278 lbs. complete.

TYPE B-4

30 H.P., Four Cylinders, mounted vertically on a common crank case. Weight, 130 lbs. complete.

¶ Our motors express the ultimate achievement in engine construction, fulfilling a degree of perfection which leaves nothing to be added or desired in the way of improvement, and the construction is so thorough and sincere throughout that the reliability, which aviators demand, is guaranteed as far as is humanly possible. :: :: :: ::

Favored exclusively by the experimenter in the science of flight, as it insures to him the maximum of safety

American Builders of the STANDARD VOISIN TYPE AEROPLANE

"THE ARISTOCRAT OF FLYING MACHINES"

The only type machine not infringing the Wrights' Patents

Easton Cordage Company, EASTON, PA.

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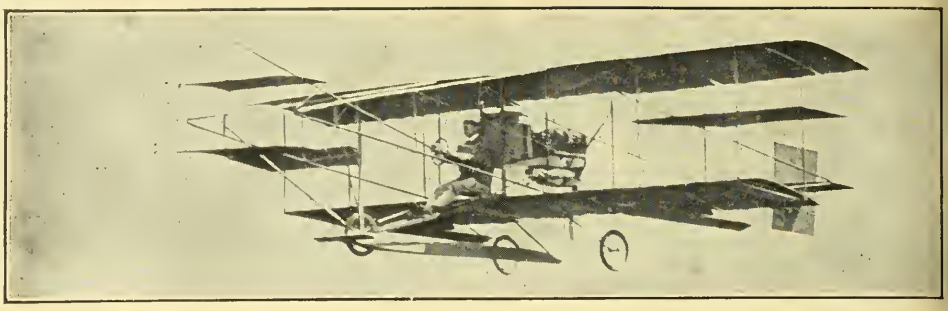

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USED BY

GLENN H. CURTISS

on his record aeroplane flight from Albany to New York

Vacuum Oil Company,
29 Broadway,
New York City.

Dear Sirs:

I am pleased to report the success we have met with in the use of "Mobiloil" in lubricating the engines in our aeroplanes, and to say that it maintained its reputation in my Albany-New York flight.

Very truly yours,

J... .., 1910. G. H. Curtiss.

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ROCHESTER, U. S. A.

Vol. VII AUGUST, 1910 No. 2

AERONAUTICS

THE AMERICAN MAGAZINE
OF AERIAL LOCOMOTION

acts About "Elbridge" Engines

More actual power for weight than any other engines in the world!

Only engines with unlimited guarantee based on actual performance!

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or otherwise) than
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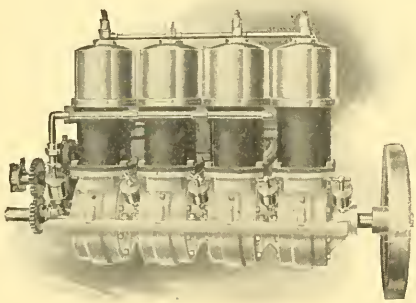

Extra large bearings,
—more than 15 in. in
4 cylinder engines.

A refinement of detail only possible in a light weight engine that has actually been on the market more than four years.

ELBRIDGE "FEATHERWEIG.

Elbridge rating, 40 h. p. A. L. A. M. rating 60 h. p. Weight 167 lbs.
Also made in 2 cyl. 20 h. p.; 3 cyl. 30 h. p.; 6 cyl. 60 h. p.
Air-cooled engines, 1 to 4 cyl. 5-20 h. p. at 1,000.

Particulars and prices on request

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Culver Road :: :: :: :: :: :: Rochester, N. Y.

HF

WE MAKE YOU FLY

"That engine will fly any properly built plane"
—Capt. Thomas Baldwin

"I made a 25 mile flight (at Mineola) yesterday (July 12), the engine not missing once"—George Russell

The HF Flying Power Plant

Four cylinder, vertical, four cycle, water cooled engine, 30 H. P. and 50 H. P.; 100 H. P., 6 cylinder

1. Engine.
2. Oiling System, force feed.
3. Oil Tank, aluminum, integral with crank case.
4. Carbureter (aluminum), aviation type.
5. Water, circulating pump.
6. Radiator, special HF aviation type.
7. Magneto, Bosch type or Eiseman Automatic advance.
8. Copper Gasolene Tank.
9. Propeller, laminated mahogany.
10. Steel hub and thrust bearing.
11. All necessary wiring; piping for gasolene, water and oil.

COMPLETE TOOL KIT—Water plug, wrench, socket wrench for plugs, screw driver, wrenches for all nuts used, monkey wrench, pipe wrench.

Price, 30 H. P. Power Plant, $1250.00
50 " " " 1675.00

The customer has no further expense except gasolene and oil

HARRIMAN MOTOR WORKS, INC.

SOUTH GLASTONBURY, CONN.

Get Ready to Fly

ONE thousand satisfied clients testify that the service, the stock, the painstaking attention of the

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is invaluable to builder, novice, owner or aviator.

¶ In response to a persistent demand we have inaugurated a new department. We will build complete machines in our own shops to your specifications. Full size or models with or without our special advisory service.

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First in all America

Glenn Curtiss Flies from Albany to New York City

In a Bi-plane Equipped with

PALMER AEROPLANE TIRES

Hammondsport, N. Y., June 4, 1910

THE B. F. GOODRICH COMPANY
Akron, Ohio

GENTLEMEN:—I have your letter of June 1st and thank you for your complimentary expressions.

The Palmer Tires, with which I equip all of my aeroplanes give the best of satisfaction for the purpose. The light weight *does not greatly impede the lifting power*‡ of the machine and the great resiliency enables me to *land without shock on the hardest ground*† and to *pick up speed quickly in starting**. I am glad to credit a part of the success of my aeroplane to the Palmer tire.

Yours very truly, (Signed) G. H. CURTISS.

* "Curtiss jerked a lever. The machine glided along the ground for perhaps fifty yards, and then rose steadily, gracefully in the air."—*The Outlook*, June 25.

† "Calm and cool, as unruffled as if stepping out of a street car, Curtiss, as he landed, called out, 'where's that oil and gasoline?'"—*The Outlook*, June 25.

‡ "There was a sudden whir of the engine, a dash across the field, and then like a huge bird Curtiss, in his aeroplane, rose gracefully in the air, circling about so as to come within the limits of Albany."—*The Outlook*, June 25.

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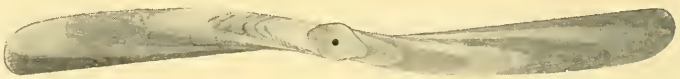
OUR true pitch, laminated ash and mahogany propellers combine all the most valued and proven features of foreign and home practice.

THEY are built in large quantities on the interchangeable plan.

WE specialize. You get the benefit of our experience.

YOU know the value of buying a stock article, one which is past the experimental stage.



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6 ft. dia. for 20-30 H. P. (Thrust 200 lbs. @ 1,200 R. P. M.)	$50.00 at our Works	Larger sizes to order
7 ft. dia. for 25-40 H. P. (Thrust 250 lbs. @ 1,200 R. P. M.)	$60.00 at our Works	
8 ft. dia. for 30-60 H. P. (Thrust 300 lbs. @ 1,200 R. P. M.)	$70.00 at our Works	

TESTIMONIAL

NEW YORK, July 9th, 1910.

THE REQUA-GIBSON COMPANY, No. 225 West 49th St., New York.

Gentlemen:—It gives me pleasure to be able to tell you that your propeller has given me entire satisfaction. I think the silk reinforcement on the tips is a great improvement, as I have had broken wires, etc., get caught in the propeller without doing serious damage to same.

Whenever I can say a word for the REQUA-GIBSON propeller you may rest assured that I will do so.

Very truly yours,
(Signed), THOMAS S. BALDWIN.

Small propellers for Models 10-16" dia., $5.00
Mail or telegraph 10% of amount and we will ship C.O.D. for balance, plus cratage.

When ordering state the direction of rotation of propeller when you stand facing the breeze made by the propeller, clockwise or anticlockwise?

If uncertain as to the size you require, state the horsepower of your engine and its speed.

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3 Cylinder, 30-45 H. P., 138 1-2 lbs. . $750.00
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6 ft., 6 1-2 lbs. 50.00
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The 6 ft. propeller gives 200 lbs. thrust at 1200 R. P. M.

Model Propellers, laminated wood, 10 in. to 15 in. perfect screw, ... 5.00

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1-32 in., 200 breaking strength, price per ft. .03
1-16 in., 500 breaking strength, price per ft. .03½
3-32 in., 800 breaking strength, price per ft. .04
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Nickel Steel Tubing
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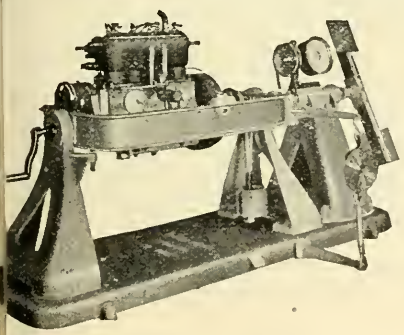

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Dynamometer tests of aeronautic motors made for inventors, manufacturers and experimenters.

Any size—Any speed

Reliable, conclusive and confidential reports.

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Designer, Contractor, Operator
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For Sale—Four new spherical balloons, four new dirigible balloons, just finished. Will sell at reasonable prices.

HAMILTON DIVES—ALL HIS FLIGHTS ARE MADE WITH A BOSCH EQUIPPED AEROPLANE

Aeronautics

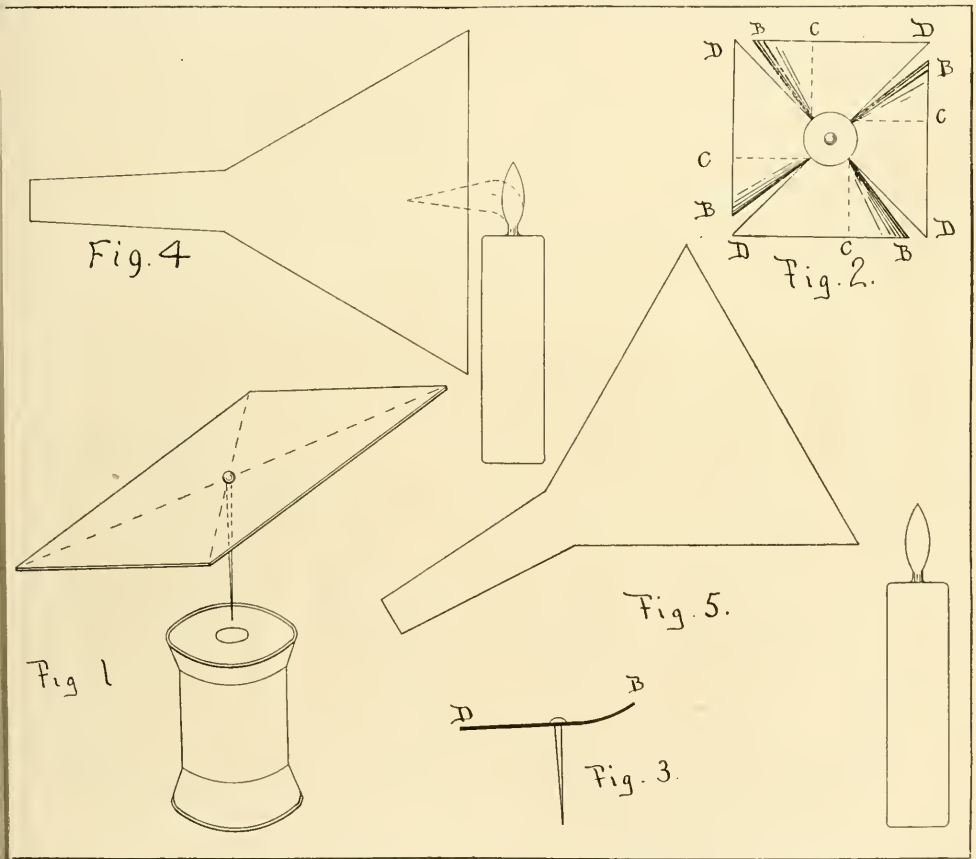
AIR currents and the effect of moving bodies in the air have been a source of baffling mystery to even some of ne most scientific minds, and how true this may be determined by a few interesting xperiments, easily made by anyone without xpense.

Most everyone has seen the so-called ball ozzle in which a stream of water moving ith considerable force is caused to form a ollow cone by means of a loosely mounted free ball directly in the path of the water. o matter what force the stream of water has cannot dislodge the ball. This is purely n air current phenomenon and may be con-dered a physical paradox.

Paradoxes of The Air :: By C. W. Howell, Jr.

Director, The Aeronautical Society

If we take an ordinary lightweight visiting card and stick a pin through the exact center of it (which may be determined by drawing lines diagonally from each corner) as shown in Fig. 1 and then place the pointed end of the pin into the hole of a thread spool, allowing the card to rest upon the head of the spool, and then blow through the other end,



The miniature whirlwinds one often sees the street and roads are true air cones cause they develop force enough at their ex sufficient to pick up dust, small sticks, ., while at their frustrum for a considerable ace about their axes there is little or no rce except that caused by atmospheric pres-re supplying the losses caused by friction of e inner wall of the air cones.

it will be found impossible to blow the card away from the spool, in fact, the harder one blows the more impossible it is to dislodge the card. Even though one blows and then points the whole apparatus toward the ground, allowing gravity to assist, the card cannot be dislodged.

If now we take a card about 2¼ in. square (Fig. 2) and find the center by means of the

diagonal lines and then strike a circle about the center, having a diameter twice that of the hole in the spool and then cut along the diagonal lines from the circle to the corners and then bend the four corners BBBB upward at the dotted lines CCCC a pin-wheel or air vane will be formed which, when inserted in the spool in the same manner as the previous card experiment, will rotate with great rapidity as long as one blows through the hole in the spool. Care must be taken to only bend the corners BBBB upward and the pin must be inserted as shown in Fig. 3. If the corners DDDD are bent downwardly or if the pin is inserted any other way the experiment fails owing to there being an air space between the card and the spool.

Another interesting but not so easily performed experiment is to place a lightweight visiting card lengthwise on the under side of one's fingers when extended and held closely together, holding it against the fingers lightly with the other hand. Now blow on the *back* of the fingers between the second and third and midway between the joint and knuckle—the other hand may then be removed and the card will adhere to the fingers as long as you blow. It takes a little practice to accomplish this, but it is worth the trouble.

The most interesting of all is the experiment performed with a funnel and candle. If a lighted candle is held so that the flame is positioned at about the center of the large end of the funnel as shown in Fig. 4, not only is it impossible to put the flame out when one blows through the small end of the funnel, but the flame will be *drawn into the funnel* toward the mouth, and no heat effect will be felt at all.

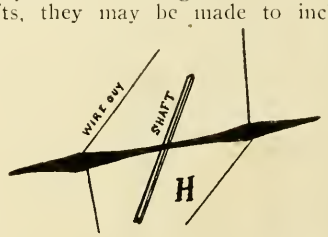
Now hold the candle and flame in the relative position shown in Fig. 5 and the flame can be readily extinguished by blowing through the small end of the funnel.

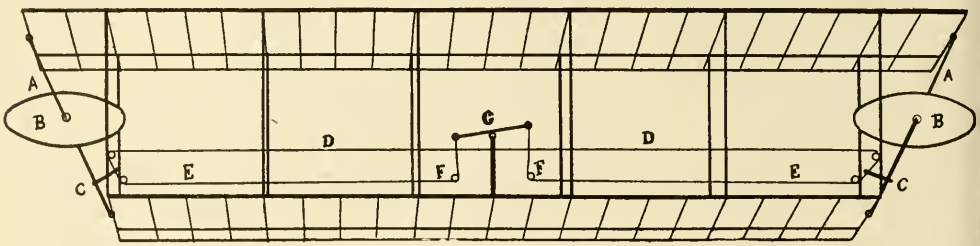
To my mind this experiment clearly illustrates the theory of vortex rings or more truly vortex *currents* or better yet *cone* currents, and I firmly believe that exploration in this field will bring forth new ideas and new principles will be discovered that will lead to the perfection of air devices in general and the propeller in particular, because I do not think that the real effect of moving structures in or through the air is understood in spite of the fact that flying machines are no longer a novelty, and I hope that a general discussion will arise through the presentation of the experiments outlined here.

A New Control

THE method of aeroplane control illustrated has been designed by James S. Stephens, 7321 Bond Ave., Chicago.

The upper plane or deck of a biplane is made to project at each end beyond the lower. This in itself is claimed to add to the stability of the machine "by presenting a more efficient lifting surface to the air on the side tending to dip, and at the same time compensating for the deficient lifting power of the upper plane due to the resistance and disturbance of the air currents by the lower plane."





An inclined shaft A is journaled in ball bearings on the ends of each plane; midway between the planes on this shaft a circular plane B is attached and supported in a normally horizontal position by suitable wire guys. An arm, C, projecting at a right angle from the lower end of each shaft, has a flexible wire connection, D, from one to the other on one side, while the connection on the other side, E, passes up through pulleys, F, to a rocking arm, G. Any movements of the ends of this arm up or down will rotate the shafts, A, tilting one of the circular planes and the other down, giving a lifting effect on one side and depression on the other, the rocking of the arm G being a natural movement in opposition to the tilt of the machine.

In the adjustment of angles of these inclined shafts, they may be made to incline rearward or forward to such an extent as to present dihedral angles to the main planes when turned on their axes, thus giving a more positive lifting effect opposed to end tilting downwardly.

These planes are of circular form and in section as shown at H this form and section presenting a sharp edge to the air as it meets and leaves the surface and at the same time providing a concave surface on either side, thus greatly adding to their efficiency.

Can a Man Fly With Wings?

By H. La V. Twining

[Continued from the July Number]

Some experiments performed by myself in 1895 have a bearing upon this. If a silk cloth be hung up and a turkey wing be spread open, it can be vibrated in various positions in front of the cloth, and the action of the wing on the air can be easily demonstrated.

If this be done the following results are obtained: When the front edge of the extended wing is presented to the cloth, and the wing is vibrated in imitation of the flapping wing, the cloth is sucked in all along the front of the wing. This shows that the air is moving bodily from the front toward the wing. If the rear edge of the wing be presented, the air is sucked in along the rear edge. If the top of the wing be presented, and be vibrated to and fro toward it and away from it, the cloth is again sucked toward the wing. In fact, it clings to the wing as though it were glued there. If the bottom of the wing be presented the same thing takes place. This shows that when the wing is struck toward the cloth, the cloth is not driven away, but, on the contrary, it rushes to meet it.

If now the rear tip of the wing be presented, the cloth will be blown violently to the rear, downward and rearward. This simple experiment reveals at once how the wing is acting on the air.

As the wing beats, the air rushes in toward it from all directions except one, and here it is blown violently away. From this we are entitled to draw certain conclusions. The wing in beating creates an area of low pressure, and the air rushes in from all points toward this area, except the point where it is blown away. Now the more air the wing displaces the stronger the air rushes in.

When we remember that the air produces a pressure of 15 lbs. to the square inch, we can see the enormous possibilities here. Pressure on the wing is produced then in proportion to the displacement of the air. If the air were all displaced, then the incoming air would press against the wing with a force of 15 times 144 or 2,160 lbs. per sq. ft. This pressure, of course, can not be realized in practice, but the possibility for enormous reactions lie here. The pressure of the incoming air is all utilized in giving lift on the under side of the wing. When the wing strikes down it meets air coming toward it. When it strikes up, the upper surface meets the same condition. Here is the rock upon which all ornithopters built up to the present time have split. The up stroke throws them to the ground with as much force as the down stroke throws them up.

Evidently this is not the case with the flying birds, because they fly, and if their up stroke threw them down, this could not happen.

What then is the peculiar structure of the bird machine that prevents this? Much speculation has been indulged in as to the feathers opening on the up stroke to let the air through.

Just a little intelligent observation of an extended wing will show how utterly fallacious this assumption is. The feathers overlap so that they shingle on top from the part near the body to the tip. On the under side they shingle the other way. In either case, as the air strikes the surface, the feathers bind together and present a solid surface to the air. The direction in which they shingle cannot make any difference in this respect. If we take up the wing and blow violently on top of it, holding the hand on the other side, no air will be felt coming through. If we blow against the under side the same result is obtained. Some have argued that the bird turns the feathers edgewise by means of muscles in the wing, but I have dissected many wings, and have looked in vain for any such muscles. If we get hold of the tendons of the muscles and pull them, we can see what they will do. There are no muscles singly or in sets that perform any such function that I can discover.

Furthermore, if one observes large birds, such as the pelicans, turkey buzzards, sea gulls, etc., as they go overhead, one would be able to see the blue sky through them if they turned on edge.

In soaring, the turkey buzzard spreads out its feathers at the tip of the wing more or less like the spreading out of the fingers, but this is a disadvantage rather than an advantage as it lets air through from below.

Then again, birds in flying throw the wing open strongly on striking down with it, and fold the outer joint considerably upon the up stroke. This accomplishes just the opposite result from what those who advance the above theory are looking for. It closes the feathers together in a tighter mass than on the down stroke. It, of course, presents less surface to the air on the up stroke, but it serves a very important purpose as we shall soon see.

The reason why the up stroke of the wing does not throw the bird down lies in the peculiar structure of the machine as a whole.

The fact that the front edge of the wing is attached to the shoulder, forward and above the center of gravity is a fundamental principle in bird flight. Under these conditions the up stroke develops a pressure on the upper surface of the wing, which rotates the whole machine around the front edge of the wing as an axis or fulcrum, and thrusts the bird forward, in the plane of the wing. If the wing is pitched upward, then the resultant motion is forward and upward. If the wing is pitched downward, then it will be thrust forward and downward. Whether the wing be pitched upward or downward depends on the will of the

bird. By raising its abdomen or lowering it, it can go up or down as it chooses. When it wishes to fly down, it contracts a set of muscles that raises the abdomen relative to the plane of the wings. This raising of the center of gravity also brings it farther to the front, and as a consequence, the bird pitches forward. If it desires to go upward, it lowers the rear of the body, thus depressing the center of gravity and drawing it backward. This displacement of the center of gravity with reference to the center of pressure controls the fore and aft stability of the bird. The fact that this center of gravity is below and to the rear of the front edge of the wing is of vital importance in the maintaining of fore and aft stability. The tail is also used in maintaining fore and aft stability.

The center of gravity acting downward vertically is pitted against the center of pressure on the wings acting upward. The center of gravity acts over a lever arm with the front edge of the wing as a fulcrum, the feathers being the lever arm over which the center of pressure acts. These two lever arms are practically equal, and the weight and center of pressure take no mechanical advantage of each other.

Because of this the body of the bird rotates downward when the wing is struck up, and upward when the wing is struck down, thus alternately rotating upward and downward, around the front edge of the wing, wedging itself through the air, always moving along the line of least resistance, which is in the plane of the wing, forward. This can be easily seen in large birds like the pelican and the sea gull. As the pelican rises from the water, if one says up, up, etc., as the wing goes up, at the same time watching the abdomen, one can see plainly that the abdomen goes down. If on the other hand one says down, down, etc., as the wing beats down, one can easily see that the abdomen rises. Furthermore, by watching the head, one can see that it goes down while the abdomen goes up and vice versa.

This can be seen in the pigeon as it is about to alight. When the sea gull is coming directly toward one, the motion of the head, as it bobs up and down, can be easily seen. E. J. Marey demonstrated the same thing with his tambours, but he misinterpreted the curves which he obtained. He interpreted his curve to mean that the bird was driven backward on the up stroke. Such a result would be impossible. A careful perusal of his book, and an inspection of his curve will show that instead of being driven backward, what happened was this: the abdomen was rotated downward, on the up stroke, thus giving the tambour between the shoulders of the bird a backward movement. This registered a backward movement but it was not a backward movement of the bird, but a backward movement of the tambour, which was located above and on a line with the front edge of the wing.

The inertia of the weight caused it to press on the drum of the tambour, thus recording a curve on the kymograph, which he interpreted erroneously.

The up stroke of the wing thus becomes exceedingly effective, and it results largely in driving the bird forward, while the down stroke develops the lift principally. We can now account for the weakness of the elevator muscle. When the up stroke is made the bird rotates downward, presenting the under surface of the wing at a greater angle of incidence. The inrushing air striking the under side of the wing reacts upon it and the big pectoral muscle has to take up the strain.

Thus the elevator merely thrusts the mass of the bird forward, while the pectoral muscle has to assume the bulk of the work that results from that thrust. The folding of the wing on the up stroke also helps to produce this rotation by giving the feathers at the tip greater leverage.

Inertia plays a most important part, not only in the flight of birds but also in the flight of aeroplanes of all kinds. When a stone is thrown through the air, it does not rest on the air, it pursues a path which is the resultant of two forces acting on it. One of these is gravity pulling it downward, and the other is the momentum of the stone itself, which tends to keep it in a straight line. The resultant curve is a parabola. The same thing happens to any projectile whether it be an aeroplane, a bird or a stone. So by virtue of its motion, the bird only needs to strike the air often enough to keep up its motion or to lift it back through the distance fallen through in the interval of time between strokes.

Furthermore, inertia, whatever its nature, acts like a resistance. If a body be moving in a straight line it resists any tendency that tries to deflect it from a straight line. It takes an appreciable amount of time to overcome that resistance. Hence, if the moving mass be constantly kept in a straight line by reactions against the air, its inertia prevents it from developing the result of the pull of gravity, and hence it had practically lost its weight. Consequently the reactions necessary in keeping it in a straight line are those necessary to handle its mass only and not its weight.

Finally a man-carrying machine can be built weighing not more than 80 lbs., which with the weight of the aviator, 140 lbs., makes in all 220 lbs. The question is, has man power enough to get 220 lbs. into the air and maintain it there? At first sight the answer to this question seems obvious enough, and the answer is, no.

But if we consider that a soldier can put 75 or 80 lbs. on his back and march all day with it, we see that a man has power enough to handle his weight and the weight of a machine as well.

Again a man weighing 200 to 220 lbs. can handle his weight, although possessing no more power that a lighter and more sinewy man. In order to accomplish this a man must bring his whole muscular system into play, in operating the wings; and this must be done also to the best mechanical advantage possible.

This has been done in the ornithopter mentioned above. Hand and foot levers have a mechanical advantage of 4 to 1 in their attachment to the front edge of the wing. The operator stands on the foot levers and grasps the hand levers. These two sets of levers attach to the front edge of the wing on opposing sides of the main bearing of the wing upon the frame, so that the weight of the operator thus thrown alternately upon the levers in the up and down stroke, the weight being in fact constantly supported by the opposing pulls of the hands and feet, around the bearing of the wing upon the frame. The weight to be lifted is 220 lbs. This is then to be lifted by striking the air with the wings in an up and down stroke, so that only a 110-lb. reaction needs to be developed under each wing in order to lift the machine as a dead lift. The application of a 30-lb. pull between the hands and feet brings a 120-lb. pull to bear on the wing in order to depress it. This is 10 lbs. more than necessary in order to balance a 60-lb. reaction under the wing necessary to lift the machine. Under these circumstances experience has shown that the wing can be driven fast enough to develop this reaction. In fact the wings on the above machine will not have to make more than 60 half beats per minute in order to develop this reaction. With the wings made a trifle larger, the speed can be very materially reduced. Experiment has already demonstrated that the pressures can be manually developed and that with a 30-lb. pull on each side or 60 lbs. in all.

It must be recognized that this pull is the maximum pull necessary to get the machine off the ground. After getting on the wing no such pull will have to be maintained. The only remaining thing to be determined is as to whether the wing is a very efficient transformer of motion or a very inefficient one. If it be very inefficient then man cannot hope to fly by manual power, but if it be a very efficient one then in my judgment men will fly by the exercise of their muscles as a bird does.

The wing when operated displaces the air as before shown, and in so doing creates air currents toward it, and these air currents produce a pressure upon the wing in proportion to the mass of the air displaced, hence there is practically no slip; because the greater the stream of air driven to the rear, the greater the pressure returned to the wing by the incoming air. On this account all the energy expended on the air comes back again in the shape of pressures which drive the machine forward and give it lift. There are frictional losses of course.

In this paper some of the principles only are considered. There are others that we can hope to attack with some intelligence only upon the completion of experiments now in progress. Experiments only can furnish the data upon which to base the calculations.

The ornithopter above described is fully protected by pending patents.

(*Concluded*)

The World's Record Altitude Flight

By W. R. Brookins

In preparing for the high flights at Atlantic City I had put on a sweater and heavy gloves and was sweating to beat the band when I started. After passing the three thousand foot mark I began to get much cooler. Over the land would be a little bit warmer than over the sea. And at six thousand feet I actually shivered. Beginning at three thousand feet I had to frequently yawn to reduce the air pressure from within on the ear drums. Over the ocean I could see absolutely nothing below me but mist, although on the ground the atmosphere seemed perfectly clear. The sky above was perfectly clear and the sun was just setting, but I had to circle over the land to get my bearings. Down on earth the sun had already set. I had to follow the "feel" of the machine to determine whether I was climbing. At that height one cannot tell whether he is steering down or up except by the "feel."

I had to fly over a certain spot, a boat anchored out in the sea beyond one of the piers, in order that the engineers might follow me for their measurements. Just as I was crossing the line of the beach, coming in shore, I heard the engine miss twice and I immediately turned for the stake boat, in order to let the engineers catch me, and throttled the machine so as to allow some of the gasoline to run forward and down the pipe to the engine. This kept me going beyond the boat when the engine went dead and I turned and circled down. From a thousand feet high I had to figure how to reach the landing between the piers on the beach.

Humidity and Flight

By Dr. A. F. Zahm

"Humidity has a great deal to do with the success of a flight. If the percentage of moisture in the atmosphere is low, it is much more difficult to fly. The engine gives less power, the propeller gives less thrust and the surfaces have less lifting effect."—Statement credited to Glenn H. Curtiss.

If it be admitted that the engine gives less power, it naturally follows that the propeller gives less thrust, and the surfaces have less lift than they would have with larger power. But it would be wrong to assume that the propeller gives materially less thrust at the same speed in dry air than it does in moist, or that the lifting surfaces, at the same speed and inclination, give less support in dry air than in moist. On the contrary, at a given pressure and temperature the density of dry air is slightly greater than the density of moist air; it may be as much as 1 per cent greater. Now, for a given speed and angle of impact, the thrust or support varies directly with the density. Hence, at most it could vary but 1 per cent due to moisture, all other conditions being the same.

Reference should also be made to "Flying and Humidity," by Charles F. Willard, in the June, 1910, number.

Center—Brookins (left) and Hoxsie
Bottom—Orville and Wilbur Wright

Flying Meets in

Height Records Broken

Indianapolis, June 12-18.

BY R. E. SCOTT.

The Exhibition Department of the Wright Brothers Company made its initial bow to the general public at the Indianapolis Motor Speedway during the week of June 13-18. Several important points were demonstrated at this meet; points of interest to promoters as well as to aviators.

So far as the flying itself was concerned, the meet proved pretty conclusively that the Wright aeroplane is a very steady and dependable machine. There were about sixty flights during the six days of the exhibition, and there was no suggestion of an accident.

In the tranquility of the performances—the invariably successful starts, and quiet, uneventful landings—lay the chief beauty, from the writer's standpoint of the meet.

But in just that same tranquility lay its chief drawback from the standpoint of the box-office. Peace and quiet are all very well in their way, but after a man has loafed around a railroad station thirty-eight minutes waiting for transportation to the field, has quietly sat on a plank upholstered bleacher divan at a temperature of 120 Fahr. for three hours waiting for something to happen, and with equal peace of mind finally watched—at a distance of half a mile or more—these great white birds rise gently into the air and sail placidly around the track until fancy moved them to descend, that man is apt to lean toward something more stirring than the prospect of quietly walking two or three miles along a country road to where he can find a suburban trolley to take him back to town.

Walter Brookins furnished the incidents of most spectacular interest during the week. The first day, after several races against himself around an unmeasured course, Brookins made an attempt at an altitude record. His altitude was taken by A. B. Lambert, of St. Louis, with a combination of yard-stick and two pin-points an inch apart. Attached to the aeroplane was also an instrument for recording altitude. This was hung between the planes on a strap, but is said to have been put out of commission by striking guy wires as it swung about.

NEW WORLD RECORD.

Brookins climbed for twenty-four minutes, at which time Mr. Lambert announced the altitude of the machine as 4,384 ft., as against Paulhan's Los Angeles record of 4,165 ft. The descent lasted about six minutes.

Brookins, in an earlier attempt, had ascended 2,093 ft. It was the greatest altitude attained by a novice and the greatest ever made in an American-constructed aeroplane.

Brookin's flights were a revelation. He cut sharp circles, mounted quickly as a bird, shot to the ground, swooped and dived, bringing out enthusiastic applause.

Twice during the day Orville Wright flew, on one occasion taking up Carl G. Fisher, of the Prest-O-Lite Co.

UP 2,083 FEET.

The altitude record was again assaulted on Tuesday, June 14. Brookins climbed for 12 minutes. The engineers who took the altitude by triangulation, figured his altitude at 2,083 ft., and these figures were corroborated by the recording instrument which on this occasion was properly fastened. The descent lasted six minutes.

Many States

Sensational Flying

A feature of the second day was a "contest" between a Wright aeroplane and an Overland 40 h. p. automobile rigged as a "wind wagon." A stock car was stripped and driven by a wooden propeller 8 ft. long, at 750 r. p. m. Official figures are lacking but the Overland company states that 5 miles were made in 5:20 (53 miles an hour), while a figure gleaned from another source gives the time at 4:58 for 2½ miles. The car weighed 1,800 pounds. The drive shaft was not connected with the differential. The propeller was driven by a chain from a driving sprocket having 17 teeth attached to the shaft, the chain running over an overhead shaft with a sprocket of 31 teeth.

Johnstone made his longest flight, 55 minutes, on this day, going up to 920 ft. altitude.

Orville Wright flew again on the 15th making beautiful maneouvres in the dusk, after the program had been delayed by rain.

BROOKINS' MARVELLOUS TURN.

Perhaps the most sensational event of a thrilling week was Brookins' quick turn on June 16. He made a complete circle in 6 2/5 seconds, and his main planes assumed so nearly a vertical position that many thought he was falling. Only one of the many photographers on the field had enough presence of mind to snap a camera at him. This one picture was caught when the machine had begun to take its normal position, but the angle with the ground is still a very sharp one. This is reproduced in this issue.

3,876 FEET HIGH.

Arch Hoxsie's motor stopped while Ralph Johnstone was making a 44-minute flight and he had to land outside the Speedway. Then Brookins went up for another altitude flight and after climbing 45 minutes, reached an altitude of 3,876 ft., officially measured by city surveyors. The flight lasting 54 minutes 20 seconds. The barometer carried on the machine registered but 3,700 ft.

ANOTHER NEW RECORD.

Again on Friday, June 17, Brookins made another try for the record. He carried two instruments—a barometer within plain sight and the recording instrument—and his altitude also was taken by reputable engineers. Brookins climbed steadily for 55 minutes, and his barometer showed him to be about a mile high. The engineers had no opportunity to catch him at his greatest height because he was then so far from the earth that he could not exactly locate the Speedway and consequently sailed, still climbing, twice across the course out of range. The duration of the flight was 1:04:00.

As if the climb in itself were not sufficiently sensational, Brookins' motor stopped at an estimated height of 3,000 ft. He then was perhaps four miles from the center of the Speedway, and the spectators, not realizing that the engine was no longer running, wondered why he was making the long descent in almost a straight line. The aeroplane just made one long streak for the earth, and landed beyond a clump of trees at some distance from the track. There was a rush of excited newspaper correspondents and spectators towards the automobiles, but it was stopped when some one with a field glass announced that the landing was safely accomplished. The altitude was officially measured as 4,939 ft., a new world's record. During this flight Johnstone and Hoxsie each were flying.

Brookins Turns Complete Circle in 6 2-5 seconds

Numerous good flights were made during the week by Hoxsey, Johnstone, La Chappelle and Coffyn, but they were uneventful because of the lack of competitive features. A number of races were scheduled but none were actually attempted. Ten flights with passengers were made.

To Captain G. L. Bumbaugh belongs the credit of making the first flight on the Indianapolis Speedway. On Friday, preceeding the opening of the big meet, and while the Wright forces were engaged in assembling their machines, the engine for Captain G. L. Bumbaugh's machine was delivered on the grounds. Carl A. G. Fisher, owner of the machine, offered to wager Roy Knabenshue, of the Wright Co., that Captain Bumbaugh would be in the air before any of the other 'planes were ready. The wager was accepted and both sides hustled to get their machines in readiness. Captain Bumbaugh's engine, an Elbridge "Featherweight" 40-60 h. p., was hastily installed and the aeroplane brought out of the tent. At the first attempt Captain Bumbaugh's machine rose from the ground, after a run of about 100 yards. But the Captain underestimated his power reserve and the machine shot into the air about 30 ft. before he thought to reverse the elevating plane. When this was done his descent was as rapid as his rise had been. Skimming the ground Captain Bumbaugh again rose and on this attempt flew for about half a mile before the tricky elevator plane again brought him to the earth.

Such repairs as were made necessary by this rapid descent were completed by Monday, the first day of the meet, and early in the evening Captain Bumbaugh prepared for another try. This time he was over cautious in the other direction. Realizing that the powerful engine might drive him into the air faster than he cared to go, he deflected the elevator planes befor the start. The machine got away with a rush. A slight obstruction was encountered, just enough to jolt the machine clear of the ground; with the deflected plane in front and the thrust of 50 h. p. behind, the aeroplane keeled over onto its head, burying the aviator in the ruins. The engine continued running, the propellor threshing the guy wires, until Captain Bumbaugh recovered sufficient presence of mind to kick loose his ground wire. To the immense relief of the spectators Captain Bumbaugh a minute later rose to his feet and waved a reassuring hand. The damages to aviator and machine looked serious but fortunately were of such nature as to be easily repaired.

Several short flights were attempted during the weeks by J. W. Curzon, but his big Vivinus motor did not deliver power enough to offset its own weight and carry the machine into the air. Mr. Curzon announced his intention of replacing it with an Elbridge "Featherweight."

Lincoln Beachey had his monoplane, and there was the Marquette and the Shaw biplanes but none of these flew.

RESULTS.

The accumulated duration of the flights made during the Indianapolis meet total as follows:

W. R. Brookins	7 hr.	59 min.
Ralph Johnstone	1 hr.	51 min.
A. L. Welch	1 hr.	25 min.
Arch Hoxsey	1 hr.	9½ min.
F. T. Coffyn		20 min.
D. La Chappelle		1½ min.

Longest duration single flight:

W. R. Brookins ..... 1 hr. 4 min.

High altitude flights:

W. R. Brookins, June 13 (world's record)	4,384 ft.
W. R. Brookins, June 13	2,093 ft.
W. R. Brookins, June 14	2,083 ft.
W. R. Brookins, June 16	3,876 ft.
W. R. Brookins, June 17 (world's record)	4,939 ft.
Ralph Johnstone, June 14	920 ft.
Flights of which official record was taken	55

Atlantic City, N. J., July 4.

BY R. F. PATTERSON.

The series of exhibition flights organized by the Atlantic City Aero Club, composed of the hotel and business men of the town, costing $25,000, was a great success. A section of the beach was set apart for the use of the aeroplanes, and everything was free to the public. The flights were sanctioned by the National Council, represented by Augustus Post and Henry M. Neely.

On July 4 Curtiss made his first flight on the beach between two piers in a stiff breeze. The enormous crowd made flying dangerous.

The next day Curtiss made three flights, the longest being 8 minutes. This was made over the long piers, up and down the beach at a height of about 200 ft. and out over the sea.

On the 6th it was necessary to run close to the water to get hard sand. The tip of the propeller was caught by the incoming waves and broken at the ends. With another propeller a flight of 15 minutes was made, circling over the piers and the boats anchored near the shore. Then a short flight.

No flights on the 7th.

On July 8 Curtiss made a 10½-minute flight at a height of 500 ft. Then Brookins got off with a 400-ft. flight, cutting various capers and making a sharp circle similar to the one at Indianapolis. This flight lasted about 9½ minutes. While he was in the air Curtiss started again and flew above him, for 5½ minutes. Starting again, inside of 6 minutes Curtiss was lost to view, having gone down to Hugh L. Willoughby's grounds, some four miles away. Landing there he waited for his men to come and start him back. Rumors of all kinds circulated, as he was gone 1 hour 16 minutes.

BROOKINS MAKES SHARP SPIRAL.

A few minutes after Curtiss got away, Brookins started and went to a height of 1,800 ft., making beautiful curves and evolutions all the way up. He was up some 15 minutes, coming down in a spiral to a height of about 300 ft., the diameter of the spirals being not more than 200 yards. This was very spectacular. After waiting a half hour for Curtiss, Brookins started off again on a 6-minute "every day flight." Curtiss caused great excitement, as all thought he or his machine was damaged. There was cheering when someone said "Here he comes," and a speck could be seen about 4 miles away, 500 ft. up.

On July 9 Curtiss took the air first and Brookins followed in a preliminary flight, Brookins going to about 800 ft. back and forth across the piers. These flights lasted 9 and 3 minutes, respectively. A half hour later Curtiss started on a 5½-minute flight for a moving picture man. Again Curtiss started, before Brookins was ready for his altitude flight, but flew only from one pier to the other. On Sunday Curtiss made one flight of 4½ minutes.

BROOKINS MAKES ANOTHER WORLD RECORD.

Shortly after this landing Brookins started on his wonderful altitude flight. In 53 minutes he had reached a height of 6,175 ft., the highest yet attained by aeroplane. The previous official altitude flight is also held by Brookins, being 4,939 ft. The latest foreign record, 4,615 ft., was made recently by Latham in France. This day's flight exceeds all attempts by 1,236 ft. His descent, without power, for lack of gasoline, took 10 minutes, having been in the air 1 hour 3 minutes. After landing he joyfully rushed to 'phone the news of his success. This record won for him the $5,000 offered as a height prize.

While he was making this flight, Curtiss started again and made short flights of two or three miles, circling between the piers several times before landing for the last time during this day of exhibition work.

On Sunday, July 10, Curtiss gave an exhibition of a flight in a wind estimated by himself and others to be 20 miles. But for the enormous crowd, estimated at 100,000, along the board walk, piers and housetops, Curtiss would not have attempted the flight owing to strong wind and high sea rolling. He received great cheering for his 5-minute flight, circling between piers and over the

ocean. Curtiss reached a height of about 300 ft. during flight. The Wrights will not fly, or allow their own machines to be flown on Sunday, so Brookins did not fly this day.

CURTISS FLIES 50 MILES.

July 11. Curtiss started flying for the $5,000 50-mile prize at 3:24 o'clock. After finishing 50 miles, or ten 5-mile laps around piers, he circled Atlantic City. Entire flight lasted 1 hour 21 minutes. The average height was 700 ft. During the flight quite a southwesterly breeze was blowing, making a record speed flight impossible. The actual time for the 50 miles was 1:15:00. The fastest lap was 6:01 4-5, a speed of 49.88 miles per hour. The time made was not as good as previous records held by Curtiss machines. This won for him $5,000, as the Wright machine did not try for it.

Brookins made the next flight and for 15 minutes gave a fine exhibition of the control he has of the Wright machine, twisting and turning at almost impossible angles.

Curtiss then flew from the Million Dollar Pier to Old Pier to get ready for his record-climbing flight. Before this was started, Brookins attempted flying with Mr. Coffyn, another Wright pupil, as passenger. At 6 o'clock the machine ran down the monorail, but failed to rise. It was pushed back to starting point and another trial took the machine up to an altitude of 300 ft. at times. A very fine flight was made for 15 minutes with short turns and dips. After the descent, Curtiss made the most notable flight of the day—the quickest time for reaching 1,000 ft. He actually reached between 1,500 and 1,600 ft. in the remarkable time of 5 minutes 52 seconds, traveling in a straight line for about two miles, turning then and descending to earth. Shortly after landing he flew back to the Million Dollar Pier, carrying Lincoln Beachey as passenger. While hauling the Curtiss machine up the platform to house it, F. Coffyn made a short exhibition flight in the Wright machine used by Mr. Brookins. This lasted 3 minutes, reaching about 150 ft. at times. This ended the last intended day of the aviation meet at Atlantic City—but the aviators had been purchased to remain over another day.

BROOKINS' MACHINE STANDS ON END.

July 12. At 3:30 P. M., Brookins started for a flight and rose to a height of from 900 to 1,000 ft. and remained in the air some 20 minutes doing almost the impossible at times in his turns. At one turn his machine stood close to an angle of 77 degrees, and it appeared that he had turned too far by mistake. All held their breath and "Ohs" were heard all through the crowd.

An hour later Curtiss went up to bombard a life-boat with oranges from a height of 400 ft. Out of six oranges three would have hit a battleship, the last bomb landing within 12 ft. of the boat. He circled around between piers till his orange bombs were exhausted, then landed. Five minutes later he was in the air again flying down to Old Pier to interview Mr. Shackleford. After a half hour's wait the crowd saw him in the air again firing bombs at the reporters and photographers. This caused great laughter among the audience to see them dodge from being struck by a flying orange which was merely a juicy spot after striking the ground or water. This flight ended his last exhibition at the Atlantic City meet. The machine was housed and "knocking-down" began.

Brookins, however, made one more flight, doing his usual quick turns, and fooled all by coming down to earth as if to land and then shooting out to sea again, as if he had forgotten something, which eventually proved to be true, for he shot up to 300 ft. and then came down close to water, 25 ft. from shore, bringing the machine so low that the skids seemed to rest on two waves and followed them to shore. Eventually he actually struck the water near shore, rising again and then landing at his camp.

It is a strange fact, but during the entire week there was not a single accident of any kind, except the first day, when Curtiss landed in deep sand and ran into a hole, breaking one post. Outside of that not a wire, nut or any part of the machines had to be altered from the first day of "setting up."

The weather proved ideal, except one day, and the crowds were enormous. The largest day Atlantic City ever had was July 4, when, it is claimed, 300,000 attended. The entire meet was a success in every way, thanks to the management and the whole-hearted way in which it was carried out—free to all.

Montreal, June 28-July 5.

BY H. K. HITCHCOCK.

The "meet" was from one viewpoint, the scientific, eminently successful, and as a direct result an impetus to the interest in and study of aeronautics has been started in this great country. Financially the meet was a failure, the expenses running to some $40,000, but the flying was good—continuous every day of the meeting, all done by the Wright and Bleriot machines. J. A. D. McCurdy only got up once in the early morning and quite wrecked their Baddeck II in landing with the wind. McCurdy was unfortunate

The Overland "Wind Wagon" at Indianapolis

the whole week. He had trouble getting his machine on the grounds to begin with, and assembling was delayed by reason of no shelter. G. G. Hubbard, of Boston, was induced to come at a late date with his monoplane, built by the Canadian Aerodrome Co. of Baddeck, without an engine, which had to be sent for to Baddeck and it did not arrive until the last of the week.

The Wright team, Brookins, La Chappelle, Johnstone and Coffyn, all flew well. Count de Lesseps was a striking feature with his two Bleriots, a 50 h. p. Gnome engined type XII and the smaller XI with the Anzani 30 h. p. motor. His 30-mile trip to and over the city of Montreal in 49 minutes was the great event of the exhibition. He used the big "Scarabee" with air bags, the same equipment he used in his cross-Channel flight. Fred Owen and Cromwell Dixon, with their dirigible attracted small attention. Dixon tried a new propeller on the advice of Knabenshue and increased its speed. The airship escaped and burst, on the fourth day of the meet. This made quite a stir, as the people could not tell whether he was in it or not. He stopped the motor by accident, descended, jumped too soon and missed the guide rope. Johnny Mack and one of Ed. Hutchinson's men made daily parachute drops from hot-air balloons.

Wm. Carruthers, vice-president of the International Aviation Association, which promoted the meet, bought a Bleriot XI and imported one Miltjen from France to fly it. Miltjen's experience at flying was evidently obtained at a correspondence school. On his first and only flight the machine jumped into the air and then gracefully dug its nose in the dirt. Cromwell Dixon, who had never been in an aeroplane before, then tried it and made a highly sensational and wild flight, narrowly escaping accident, but brought it safely down.

SOME OF THE FLIGHTS.

The feature of the first day was Brookins' 2,000-ft. altitude flight, while de Lesseps and Johnstone were the other aviators. On the second day de Lesseps in a trial for speed lost to La Chappelle, while Brookins made another altitude flight of 1,650 ft. On the 28th Johnstone was up 45 minutes, and Brookins flew to a height of 1,360 ft., and was up 20 minutes. The start on the rail was timed, too, at 5½ seconds till the machine was in the air. On June 29 Ralph Johnstone flew for 40 minutes and Brookins was up 21 minutes, flying to a height of 2,450 ft. This was after carrying up de Lesseps for a 13-minute trip. Early in the morning McCurdy made a flight in the "Baddeck II," but, landing outside the grounds in the tall grass, the machine was partially wrecked. R. Timberlake, who had bought a Bleriot XI, essayed his first flight. With a novice's inexperience, after getting off the ground, could not stop in time to save hitting the grandstand. The next day Johnstone flew for 25 minutes and Brookins took up Count de Lesseps' brother to a height of 1,140 ft. in a flight of 25½ minutes. Then he made a trip alone up 2,000 ft.

3,130 FEET IN AIR.

On July 1 Brookins again made a high and sensational ascent, reaching 3,130 ft. in a flight covering 45 minutes.

DE LESSEPS FLIES OVER CITY.

The most sensational flight of the meeting was de Lesseps' journey over three bodies of water and Mt. Royal in a continuous flight around Montreal's City Hall and back to the aviation grounds, a round trip of 30 miles. The flight lasted 49 minutes. His face was screened from the oil of the Gnome engine by a thin wire gauze mask.

BROOKINS SETS CANADIAN RECORD.

On the same day Brookins ascended to 3,510 ft.

The meet closed on July 5, with small attendance and few flights. Some of the Wright machines were going to Toronto, but two had to be rushed away, so these were flown from the aviation grounds to the railroad station, over the hills and trees. The landing spot had not been investigated and when Brookins and passenger flew over they saw they had but a very small place to land. Steering sharply down into tall grass, the latter caught in the wires and corners, turning the machine face down and breaking the front construction. The second machine they flew over made a safe landing.

Nashville, Tenn., June 21-26.

Unquestionably among the most spectacular flights that have been made may be numbered the two night flights of Charles K. Hamilton during his exhibitions at the Military Tournament at Camp Dickinson.

FLIES WITH SEARCHLIGHT.

The first flight was in the dark of the early evening, with the moon obscured by clouds. Hamilton flew over the electric light studded grounds, almost touching the string of bulbs, then shooting up into the air and gliding down. Someone suggested a searchlight and immediately there was hustling to attach a Prest-O-Lite tank under the seat and the headlight on the front framework. About 11 o'clock in the night he was ready and the sight of the big automobile lamp flashing up and down through the semi-darkness, the moon having decided to show her face, was a thrilling one. After flying about a quarter hour a cylinder head blew out and he was forced to land.

Louisville, June 18th and 19th.

On June 18, Curtiss lowered his own record of quick starting to four seconds flat, with the Albany-New York 8-cylinder biplane, starting on very rough and grassy ground. Hamilton did it in 3 4-5 seconds at San Antonio last April.

On account of a very choppy and high wind neither Mr. Curtiss nor "Bud" Mars was able to make any very nice flights until after 5 o'clock when above a crowd of nearly 10,000 people. Mr Curtiss carried a local newspaper man for a short flight.

A stiff wind until late the next afternoon prevented any circular flights. However, after 7 o'clock Mars, at an altitude of 20 to 40 ft., raced against Curtiss around the circular track 10 times, Curtiss keeping about 200 to 300 ft. above Mars and at all times was directly over him.

For quick starting, Curtiss got off the ground in 87 ft., and Mars, with his 4-cylinder 25 h. p. got off in 106 ft. Both of these distances are behind past performances of Curtiss machines.

The total attendance for the two days was in the neighborhood of 17,000 people.

The meet closed when Mr. Curtiss carried R. O. Rubel, Jr., local agent for the Curtiss biplane, for a short flight.

Minneapolis-St. Paul, June 22-25.

At the Twin City meet there were Curtiss, Willard, Mars, Ely, Whipple Hall, Lincoln Beachey with his monoplane and two dirigibles. Curtiss flew, of course, his 8-cylinder machine. Mars had his 4-cylinder Curtiss and Willard had a new Curtiss with a 4-cylinder engine of somewhat greater power, the new engine having slightly larger cylinders. Hall had the old 4-cylinder Curtiss sold to Frank H. Johnson in Los Angeles. Ely had the machine of Henry Wemme of Portland a 4-cylinder Curtiss. Charles J. Strobel furnished one dirigible with Gintner as aeronaut, while Horace B. Wild flew the Yager airship.

The track was a bad one for aeroplane flights and the attendance small. The track was lined on nearly all sides with buildings or trees and there was only one spot on the grounds suitable for landing. Every flight of any length had to be made out beyond the grounds and return to land ing inside. The dirigibles were up every day, but the first. Hall did not get up all during the meet.

All the aeroplanes, except Beachey's and Hall's made short flights the first day. On the second the two dirigibles and Curtiss were in the air at the same time. Besides the short flights, Curtiss made one very pretty flight outside the grounds and back. Beachey got off a short distance without his controls on.

Curtiss and Brookins Flying at Atlantic City

On the third day Curtiss, Ely and one of the rigibles were up simultaneously. Beachey had ut his elevator and ailerons on and made a short ght. In the evening Beachey made another trial d ran into the fence, smashing up. The fourth y it rained. After the showers, Curtiss made a ectacular flight. Willard and Mars also flew.

Kansas City, July 3-4.

Willard and Beachey went from Sioux City to ansas City. Willard only flew, Beachey spending s time assembling the Curtiss machine. This eet was also unsuccessful from an attendance andpoint.

Willard made eight or ten short flights each day.

The Omaha meet has been postponed to July 23-28.

Willard is working his way to Mineola, where he will try out a machine of his own make, Curtiss type, with greater spread, the end of July.

Providence, R. I., July 4.

Joseph Seymour was scheduled to fly his Curtiss at Providence, July 4. He circled the track several times at a height of 20 ft. The conditions were ideal but the spectators left before the exhibition was concluded, owing to the repeated delays caused by making minor repairs.

Mars Flies Cross Country.

At Topeka, Kans., J. C. Mars, the only aviator at the meeting, as Willard did not go, as planned, on June 15 attempted to fly 60 miles cross country to Kansas City. A landing had to be made at Grantville after nine miles, breaking a couple of ribs. These were repaired and a second start was made. After going on for four or five miles the engine went wrong and another landing was made, at Newman. After an hour's stop he pluckily went on for a short distance finally coming down at Midland.

Pittsburg, Kans., July 2-5.

BY PAUL W. HARVEY.

Arch Hoxsey made fourteen flights during the 4-day Wright meeting at Pittsburg, Kan. In the last flight, which was to close the exhibition, the wind was blowing very hard and Hoxsey while some 300 ft. in the air shut off his motor intending to glide to the ground, which he had frequently done before. On account of the smallness of the ground he saw that he was being carried in his circles towards the bleacher, which was filled with people. Having no motor power to direct his course beyond the bleachers it seemed to him best to point the nose of the machine directly towards the ground in front of the stand. This he did with a result that the forward steering planes were badly damaged. He fell almost vertically about 40 or 50 ft. but he was not at all injured. The motor and transmission parts were found in good order.

Hoxsey made good flights each day. On the second he made three low flights, circling the field several times and having his machine under perfect control at all times. The first day he left the ground three times when a storm interrupted the exhibitions.

On the third he made four flights. The first three were spectacular exhibitions. He did the "Roller Coaster" flight and turned the figure eight several times. He had wonderful control of the machine at all times and as a climax to the afternoon work he made a beautiful ascent of 1,000 ft.

On the fourth Hoxsey duplicated his exhibition of spectacular flights and also gave some of the feats that aeroplanes are supposed to do in times of war. He made some short and fast short country flights and in the finish carried a passenger three times around the field for a total distance of about two miles.

On the last day Hoxsey made his usual short spectacular flights. In the last one of these he carried Mayor Hoyt and did some beautiful work. Up to that time Hoxsey had not had a single mishap and every attempt that he had made was a success.

Sioux City, Mo., June 29-July 1.

BY P. M. M'CABE.

Due to a wind which ranged from 5 to 18 miles an hour the flights given here by Mars and Ely June 29, 30 and July 1 were far from successful

On June 29 Mars attempted to circle the mile race track, attaining a height of from 10 ft. to 40 ft. Meeting adverse air currents he did not make the circle, stopping several yards short. Ely made a similar attempt but he, too, was compelled to alight without being successful. Two other attempts were made to get into the air but were failures.

On June 30 after 6 o'clock Mars made another attempt and succeeded in getting from 40 ft. to 50 ft. high and went with the rapidity of an express train for a short distance but was compelled to let down because of the winds.

On July 1, in the evening after the wind and the crowd had departed, Mars made a fairly good flight ascending to a height estimated between 100 ft. and 150 ft. He circled the mile course 2½ times and went at a good speed. Ely made one circle of the field the same evening but his engines were not working well and he was compelled to give up before doing anything of a sensational nature. Following Ely, Mars made two other flights in one circling the field twice and concluding his performance with his "Mars glide," dropping from a position of about 75 ft. in the air to an eagle like sweep and then alighting.

Ely is flying now for Curtiss, using the machine sold Henry Wemme, of Portland, Ore.

Aurora, Ills., July 2-7.

BY FRANK H. BEVIER.

A. L. Welch was the Wright aviator who filled the Aurora date. On the 5th after a 20-minute flight he had to land in an oat field. The starting track was brought and in leaving the rail one side of the planes hit the oats which had not been cut low enough and broke several ribs. On the 7th he flew for 55 minutes going up to 512 ft. The wind was bad and Manager F. H. Russell, of the Wright Co., kept the machine over two days in order to satisfy the public.

Monmouth, Ills., July 4.

Charles W. Miller, who bought a machine from C. & A. Wittemann tried for an hour and a half to get his machine to fly but failed.

New Britain, July 2.

Chas. K. Hamilton made a sensational flight over the main street of his home town, New Britain, Conn., on July 2, after a discouraging day. The flight was most sensational. The streets were crowded with people, trolley cars and automobiles. Crowds had come in from nearby towns and the governor of Connecticut with his staff was present. The conflict between two factions of the business men marred Hamilton's efforts. On his first flight he landed in a swamp and broke parts of the machine which necessitated some hours to repair. Still another short flight was made. On the third trial, he went through a series of hair-raising feats for which he is noted and then sailed on his spectacular flight over the main street.

St. Louis, Mo., July 11-16.

St. Louis, July 10. The first aeroplane meeting to be held in this country where entrants have been required to pay a fee to compete and in which there are no hired airmen to take part, will open to-morrow afternoon on the temporary aviation field of the Aero Club of St. Louis at Washington Park, Ill., and continue for six days. Ten machines have been officially entered and it is expected that all will be on the starting line at 3:30 Monday afternoon.

The coming event, known as the First National Aviation Meeting for Novices which was organized by the Aero Club of St. Louis to promote the science and sport of aeroplaning in America, is also unique in the respect that none of the entrants has ever made a public flight for pay or received cash aviation prizes of more than $250. The Aero Club has announced that no flights will be guaranteed, but as nearly all of the machines are built along established scientific lines there is little doubt that there will be flying every day that weather permits Full details will be given in the next issue.

Thomas, Bergstrom and W. C. Robinson failed to arrive and are disqualified.

The following will compete: H. W. Gill, biplane; C. W. Curzon, Farman; J. N. Sparling, monoplane; J. N. Sparling, biplane (Shneider make); H. A. Robinson, monoplane; Charles Kuhno, monoplane; W. F. S. Zehler, fore an aft monoplane; Claude Harris, biplane.

Army News.

From June 1 to June 7 Lieutenant Foulois made five flights at Fort Sam Houston, Texas, in gusty winds up to 15 miles per hour, varying in length from 5 to 14 minutes. No flights were made after June 7, as the Aeronautical Detachment was sent to Leon Springs to assist in installing the annunciator buzzer system at that place.

Captain A. S. Cowan, Signal Corps, now has charge of the Aeronautical Division, relieving Captain Chandler on June 1, 1910.

Brookins Flying Over the Ocean at Atlantic City

Curtiss Drops Bombs from Aeroplane.

Hammondsport, July 1.—Under the auspices of the New York *World* and in the presence of officers of the army and navy, who acted unofficially as observers, yesterday, Glenn H. Curtiss carried out some tests with dropping lead missiles with colored streamers attached at a target representing a battleship 500 ft. by 90 ft.

Then, of 14 record shots, 10 hits were made and 4 misses within 50 ft. of the target. Six hits were made running at 218, 232, 246, 260, 135 and 139 ft. respectively. The seventh and eighth, at 167 and 191 ft., were misses. Next, at 250 ft., hit. At 268 and 312 ft. shots were misses. Last three, at 302, 268 and 260 ft. altitude, were hits. These shots were made moving at right angles to the greatest length of the target. After these tests the officers left.

At sunset four more shots are reported, with three hits and one miss, the latter being from an estimated height of 900 ft., the machine traveling lengthwise the target.

To-day no bomb tests were carried out, but several circles over the lake were made and a landing made in the water. A small hydrocurve surface is affixed just forward of the front wheel for assistance in keeping the machine on an even keel when hitting the water.

RESULTS OF TESTS.

Mr. Curtiss gives it as his opinion that to accurately drop bombs in actual warfare one man would have to be carried for the purpose besides the aviator, as it was impossible for him to make accurate calculations of angle and speed, and suggests the proper method is to have some kind of a gun to fire the projectiles instead of merely dropping them.

Dr. Greene Hits Tree Head On.

Rochester, June 30.—Rochester can now claim to be an aviation city from more points of view than that of engine construction. Dr. Greene, who has, in the past, made several successful flights at Mineola and New York City, and who has recently moved to Rochester to open an aeroplane factory, made his first flight in Rochester to-day.

The biplane which he used was constructed for G. E. De Long of the Elbridge Engine Co., and was equipped with a 4-cylinder Elbridge feather-weight engine and a Requa Gibson 7-ft. diameter by 4-ft. pitch regular propeller.

After making his thrust test with the machine tied, and succeeding in developing considerably over 200 lbs. thrust, Dr. Greene decided that he was ready to fly, and the machine was cut loose. After running over the meadow for a distance of less than 100 ft., Dr. Greene rose at what seemed to be an angle of almost 45 degrees to a height of, approximately, 50 ft., and then flew directly down the field of the Rochester Aero Club for a distance of about one-quarter of a mile.

The start had, unfortunately, been made from a point in the field which was protected from the breeze by a large-sized hedgerow of trees, and the doctor did not appreciate the fact that a considerable breeze was blowing from his right, so that as soon as he reached the end of this hedge his machine was thrown to the left a considerable distance. When the doctor succeeded in righting himself, he discovered that he was headed directly for a tall elm tree. Of the two alternatives, dropping down and going under the tree or attempting to fly over it, the doctor chose the latter. It seemed for a few seconds as if he were going to make good, but when he was within a few yards he discovered that it was impossible, and the only thing left for him to do was then to stop the engine and attempt to glide rapidly to the ground under the tree. This also proved to be impossible, and the machine hit the tree head on, at a height of about 30 ft. from the ground, breaking the front control and knocking the machine, of course, to the ground. The rear control was also broken when the bipane struck solid earth. It seemed to the spectators almost impossible that the doctor could be alive and whole, looking at the wreck at a distance of 200 or 300 yards; but he immediately climbed out of the wreck and waved his hand in assurance that he was all right.

The flight, from some points of view, was unsatisfactory, inasmuch as it resulted in smashing Mr. De Long's machine. However, Mr. De Long was more than pleased, inasmuch as it demonstrated that the engine had considerably more power than was actually necessary to fly with this type of biplane. In the next flights that Dr. Greene makes in Rochester with this machine, in all probability, a 3-cylinder feather-weight engine will be used.

At America's Flying Field

Daily Flights at Mineola.

NOT a day now passes, scarcely, without flights by either Harmon, Baldwin, Seymour, Russell, Hamilton and others still experimenting. There are always several hundred people on hand to view the scene and on Saturdays and Sundays the number runs up into two to three thousand. Mineola is 25 miles from New York on the Long Island Railroad, and the grounds are a mile from the station and still further from Garden City.

Philip W. Wilcox has finished and given one trial his Farman-type biplane, fitted with a Rinek 8-cylinder 50 h. p. motor. Lewis Strang, winner of the Briarcliff race, will learn to fly it.

The grounds have been fenced in by the owners of the property with a high board fence 2,500 ft. long along the road, with wire fences extending out across the plains at each. There is another inner wire fence, to keep people off the course and provide parking space for automobiles. A small grandstand has also been erected and an admission fee is being charged on Saturdays and Sundays. After the expenses have been met, it is announced by the president of the land company, the income will be devoted to prizes for the aviators. The use of board fence has been sold to White & Wood, of 1777 Broadway, New York, for sign painting.

The next day Harmon and Russell provided the entertainment, but there was nothing unusual in the flying.

RUSSELL BEGINS PRACTICE.

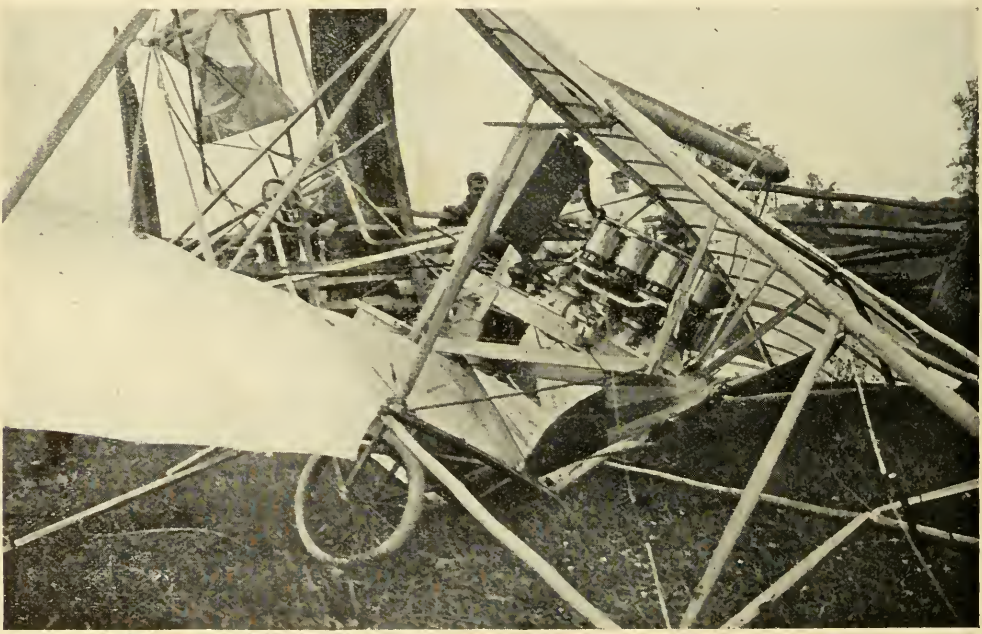
On June 29, George Russell, who had never operated a machine before, made his first flight in a Curtiss machine, fitted with a Harriman engine. The machine had been exhibited by him during the spring over a theatrical circuit. After a few days he sold the engine to P. Brauner to install in a Curtiss-type aeroplane sold to a customer and then got another of the same make. In five days Russell was proficient enough to fly a distance of about 5 miles.

On June 29 Mrs. Harmon was a passenger with Clifford B. Harmon on a 10-minute flight. This was the first time a woman has flown at Mineola and the third in this country.

Mrs. W. K. Vanderbilt, Jr., was a passenger with Harmon for a short jump of a minute on June 30. The motor would not mote, and a skid broke in landing. Further flying was given up for the day.

Harmon Sets New U. S. Record.

On July 1 Clifford B. Harmon made a new duration record for the United States, 2 hours 3 minutes, beating Paulhan's record at Los Angeles of 1 hour 58 minutes. No official figures were taken, however, of either duration or distance. The Mineola field over which he flew has not as yet been equipped with the proper markers. It is estimated that the distance covered was 100 miles.



After Hitting Tree

On July 3 the first admissions were taken in and a goodly crowd saw Harmon make a 10-minute flight alone and then a short one with a passenger. In the first he essayed the diving trick and quick rises which brought forth applause. William Watson tried out the machine he had just bought from P. Brauner, with Russell's Harriman engine, and got off the ground—and then landed suddenly, smashing up the machine considerably.

HARMON MAKES FIRST CROSS COUNTRY FLIGHT.

On July 11 Clifford B. Harmon attempted to fly from the Mineola aviation field to Greenwich, Conn., in competition for the *Country Life* trophy.

At 5:49 the Gnome engine was got going after much trouble, but the machine did not go a quarter mile across the field before Harmon brought it down again. Hamilton, who had returned to Mineola from Atlantic City, suggested leaving off the pontoons which had been affixed for use in case of a forced descent in Long Island Sound. This was done and a new start made at 6:14:50, but he flew no further than Roslyn, a distance of 4 miles, passing over roads and trees and the settlements of East Williston and Albertson Station.

Stanley Y. Beach was practicing with his Bleriot-type machine at Lordship Park, Bridgeport, intending to try to fly across the Sound to Long Island. After several efforts the machine started for the cliff, but Beach jumped out just in time to save from going over with the machine. The machine fell and was wrecked.

On July 12 Hamilton saw Russell fly for 20 minutes and then took Capt. Baldwin's machine, after weighting down the front end, and flew it for 8 minutes. Russell then went out and flew another 20 minutes.

ISRAEL LUDLOW BUILDING.

Israel Ludlow is building a biplane at Mineola which he states will not infringe anyone's patents. He claims it is a remarkable aeroplane, with its new patented applications of controls and promises it to be so stable that a man can take his hands off the lever; that it is balanced so well that it will find its own level and will keep a level flight without attention on the part of the operator. The machine is expected to be finished by the middle of August.

B. T. Babbitt Hyde is having a shed 70 by 40 ft. erected by C. O. Conklin for the housing of his machine. John H. Tyson, Jr., has bought Greeley Curtis' Bleriot which he recently imported, and it is to be flown by Louis Strang.

On the Aeronautical Society Grounds.

At the present time there are 13 machines on the Aeronautical Society's grounds. Those in process of building, of the biplane type, are Miss Todd, Messrs. Diefenbach, Talmage, Watson and Stevenson, Mergatroyd, and Edick and Edwards; of the monoplane type, Messrs. Godley, Walden De Kilduchevsky, and Rosenbaum.

Creditable flights have been made by Joseph Seymour and George Russell in their Curtiss machines. Russell is using a 30 h. p. Harriman engine, and speaks favorably of it.

Messrs. Edick and Edwards have had their Curtiss type machine out and succeeded in getting it off the ground several times for good distances. At the present time they are changing the angle of incidence of the planes and expect to have it in the field in the very near future.

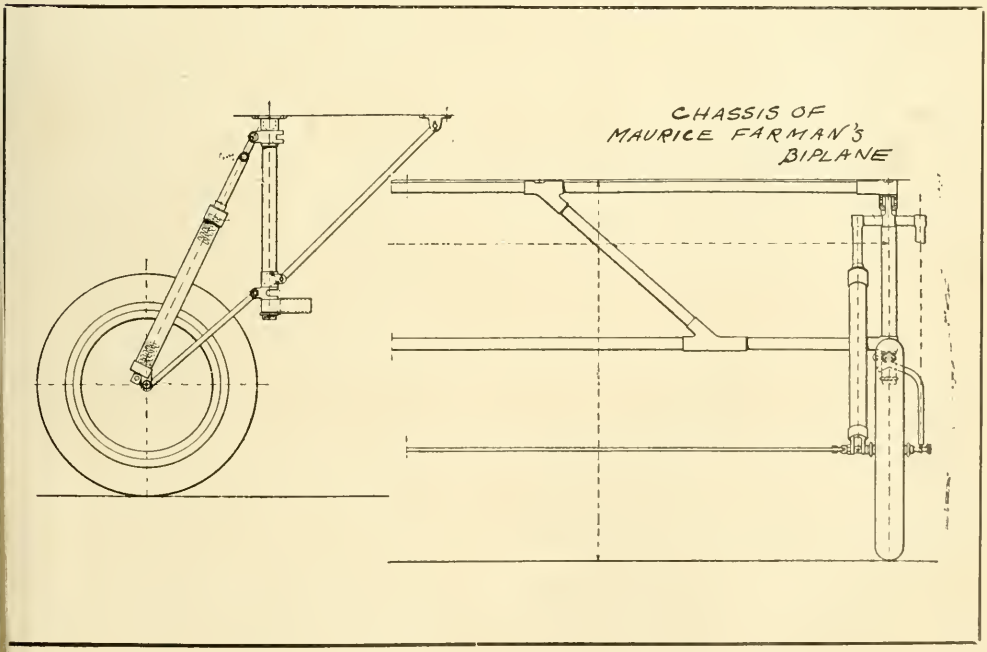
Messrs. Watson and Stevenson have had their machine in the field with a 30 h. p. Harriman motor. On June 26 Mr. Watson made an abrupt ascent for 20 to 30 ft. and descended just as abruptly, smashing the entire outrigging for the elevator control. Mr. Watson was not hurt.

Frank Van Anden has had his machine out several times in charge of Charles Nyquist, formerly with Hamilton. At present Mr. Nyquist is keeping the machine on the ground until they get it thoroughly balanced and he has learned to handle it. The motor is a Harriman.

E. H. Skinner, manager of South Beach, Staten Island, will soon be another addition to the flyers at Mineola. He has a biplane of his own design, fitted with an Elbridge "feather-weight" 40-60 engine, with which he has been making short flights for several weeks past in the vicinity of South Beach.

The Aeronautical Society is building a shelter along one side of its 138-ft. shed, 30 ft. in width to accommodate the machines which are without protection except such as tents afford.

CONSTRUCTION AIDS XIV.



Next Month—Full Page Drawings Capt. T. S. Baldwin's Biplane

For Control of National Affairs

National Council of the Aero Club of America Formed.

The "National Council of the Aero Club of America" was formed at the rooms of the Aero Club of America on June 23, following the break-up, through a shrewd political move on the part of the Aero Club of America, of the intended joint convention of the two organizations, the American Aeronautical Association and the Aeronautic Federation of America.

Twenty-six clubs compose the council. These are as follows: Aero Club of America, California, Kansas City, Kansas State, Dayton Aeroplane, Philadelphia (now extinct), Saratoga Springs, Illinois, Minneapolis, Utah, Springfield, Intercollegiate, Harvard, Baltimore, Washington, Atlantic City, Dayton Aero Club, Pittsfield, New England, Canton, Pasadena, Pennsylvania, Aeronautique of Chicago, South Bend, Buffalo and Milwaukee.

An executive committee and officers were elected to serve until the second Tuesday in December, when a convention will be called in New York.

The executive committee and officers are as follows:

Clifford B. Harmon (A. C. of America), chairman; W. B. Strang (A. C. of Kansas City), A. B. Lambert (A. C. of St. Louis), Dr. J. C. Eberhardt (Dayton Aeroplane Club), Dr. Albert F. Zahm (A. C. of Washington); Vice-Chairmen—George M. Myers (A. C. of Kansas City), Chas. J. Glidden (A. C. of New England), James E. Plew (A. C. of Illinois), John M. Satterfield (A. C. of Buffalo), G. A. Richardson (Intercollegiate Association), Carl G. Fisher (A. C. of Indianapolis), Arthur T. Atherholt (A. C. of Philadelphia).

Henry M. Neely was made chairman of the contest committee, and Arthur T. Atherholt chairman of the press committee. Col. Jerome H. Joyce was elected treasurer; Jerome Fanciulli, secretary, and Geo. B. Harrison, field secretary. Harrison later resigned.

By the terms of an agreement made between the Council and the Aero Club of America, the A. C. A. authorizes the organization of the "National Council of the Aero Club of America" and the A. C. A. is confirmed as the representative of the International Federation; all matters relating to national affairs are to be referred to the Council, to be composed of one member from each affiliated club; the Council will construct an organization on the basis of state representation; the chairman of the executive committee shall be named by the A. C. A.; the matter of location of international contests after the year 1910 vested in the N. C.; a committee shall be constituted by the N. C. to deal with the question of sanctioning national meets, providing the A. C. A. agrees it will not make any agreements or contracts in national relations without approval of the N. C.

SITUATION CURIOUS.

The situation is a curious one. As related previously in AERONAUTICS, the need for a national body was felt and in response to letters signed by Hudson Maxim, president of the Aeronautical Society, sent out by Thomas A. Hill, a large number of clubs signified their acknowledgment of such need and in the course of events a convention was planned at some central city at which a really national body would be formed.

A temporary organization was formed under the name Aeronautic Federation of America to bring about this convention and to prepare drafts and plans for the proposed national body.

Observing the apparent strength of this movement, the Aero Club hastily called a meeting of its affiliated clubs. The majority of the affiliated clubs responding to the call of the Aero Club were disgusted, and then and there, on May 23, formed the American Aeronautical Association. They found that the Aero Club was not willing to give them any voice in the affairs of the Aero Club of America and its affiliated clubs, and, as will be noted from the strong statement issued at the time, the new body was clearly against the policies of the Aero Club of America as exemplified in their action.

Leaders of both the Aeronautic Federation of America and the American Aeronautic Association immediately got together and planned a joint convention to be held in New York, June 22. Both organizations were to assemble in New York as many delegates of the clubs as possible. Both secretaries were to work in harmony and their letters were to be of the same general character. The Hotel Astor in New York was offered as a meeting place and accepted. The A. A. A. was advised that a meeting place had been secured, but unfortunately a misunderstanding had occurred and the A. A. A. letters had called the meeting at the Waldorf.

TO WORK IN HARMONY.

Previous to the June 22d meeting leaders in both these organizations got together and it was planned to call to order such delegates as assembled at either of the hotels, and then adjourn to a common meeting place. The A. F. A. was called to order in accordance with the programme and advised of the misunderstanding in regard to the hotels and it was with common consent that the meeting was adjourned and the delegates in a magnanimous spirit proceeded to the Waldorf to meet in joint convention.

A. F. A. DELEGATES SHUT OUT.

The delegates who happened to come from the Astor experienced the greatest difficulty to being admitted to voting powers in the convention. All sorts of demands were made as to the form of credentials. Many credentials were "lost" by the credential committee. There seemed to be a plan to keep these delegates out. It was also found that one of the delegates who was not empowered by his club to secede from affiliation with the Aero Club of America at the time the A. A. A. was formed, had sent out a day or two previous a great number of telegrams advising that the meeting place of the convention was at the Waldorf and not the Astor, with the apparent intention of stealing whatever delegates they might from the ranks of the A. F. A. despite the tacit agreement that both were working to the same end and in perfect accord. In response to these telegrams, many delegates who had been working with the A. F. A. went to the Waldorf.

CONVENTION AT LAST DOWN TO BUSINESS.

The session was a very strenuous one, and finally everything seemed to be working all right. The delegates had all been admitted and peace had reigned for at least 30 minutes. The whole day had been employed in seating the delegates and the body was now ready for business. A motion was made and carried to adjourn for dinner, to meet again at seven-thirty.

One of the members of the Aero Club of America invited some of the delegates to dinner and a plan was laid at this meeting to withdraw from the convention at the evening session and retire to the Aero Club of America. What mess of pottage the Aero Club could offer in exchange for the birthright of the delegates is not apparent. At any rate, the scheme worked.

When the meeting was called in the evening, the presiding officer, Geo. M. Myers, of Kansas City, asked Lee S. Burridge, former president of the Aeronautical Society and one of the prime movers in the A. F. A., to take the chair while he was out temporarily. No sooner was the temporary chairman ready to receive motions than the delegate from the Pennsylvania Aero Club got up and withdrew his club from the convention. In rapid succession one-half of the other delegates followed suit, showing that the plan so suddenly developed at the dinner had worked most successfully,

How men of self-respect could stoop to such methods as to place an innocent man in such a curious predicament, is difficult to understand. It also developed at about the same time (through the arrival of afternoon newspapers) that a corporation had been formed at Albany under the name of the American Aeronautic Association, despite the fact it was agreed between the leaders a month previous that even the name of the proposed national body would be left to the joint convention to select. This showed a premeditated plan to steal the convention. Even some of the delegates who met at the Hotel Astor, and who had so much trouble in the morning in being admitted to the Waldorf meeting, deserted the very ones who started the whole movement, and which made a national body possible at this time.

The organizers of the A. A. A. were frankly bitter against the Aero Club of America and yet they joined hands with their enemy to the desertion of their own comrades.

WHERE IS THE N. C. OF A. C. A. AT?

An officer of the National Council of the Aero Club of America states that the Aero Club of America is now but a local club on the same standing with the others, that the Council will see to it that the club is kept in such position, that in the future the Council will rule and that the only thing the Aero Club retains is its name and its international affiliation, that the A. C. A. is required to represent the National Council in international matters and to carry out its mission that the A. C. A. is "down and out."

On the other hand, it will be the chairman of the National Council's executive committee that is named by the Aero Club of America; the clubs now forming the N. C., it is said by the Aero Club, are but affiliated clubs of the A. C. A., coming meekly into the fold after rebelling, and in added numbers; and the A. C. A. never had any national control except over the old half-insurgent affiliated clubs.

The one inference to be drawn from the situation is that the Aero Club of America has decidedly increased its strength by inducing the clubs forming the National Council to become affiliated under the name of the Aero Club of America and by naming its own chairman. In return, the A. C. A. allows the affiliated clubs now known as the National Council of the Aero Club of America to merely select the place of holding any national event which may be won by a representative of America.

THE A. F. A. MADE PERMANENT.

Those who remained in convention after the exodus included the representatives of the aero clubs of Rochester, N. Y.; Florida, West Side Y. M. C. A., Canada, Amherst and Springfield, Mass.; Aeronautical Society of New York, Aeronautic Society of New Jersey, Philadelphia Aeronautical Recreation Society, the Y. M. C. A. Alumni Aeronautic Club, and the Southern Aero Club. Subsequently the representative of the aero clubs of Amherst and Springfield, Mass., withdrew and announced he would go with the other organization. The following officers were chosen by the Aeronautic Federation of America, which organization was made permanent:

President, Hudson Maxim, New York, N. Y.; vice-presidents, L. J. Seeley, Rochester, N. Y.; George W. Clark, Jacksonville, Fla.; Dr. Thomas E. Eldridge, Philadelphia, Pa.; Wilbur R. Kimball, New York, N. Y.; secretary, Thomas A. Hill, New York, N. Y.; supervisor, Lee S. Burridge.

Second Annual Aero Show of the Pacific Aero Club

By Cleve T. Shaffer

The second annual aeronautic exhibition of the Pacific Aero Club from May 19 to 21, inclusive, at the Auditorium, San Francisco, was a great success from an exhibition standpoint, the variety of machines giving a liberal education in aeronautics. No one who had seen the first exhibition of the club, it gave a startling idea of the marvelous progress in the science in less than a year, and the tremendous increase in public interest. At the first show there were but two comparatively crude machines—the latest show filled the hall and even intruded upon the model flying area, several of the model flyers, disobeying their rudders, flew to the big machines like angry hornets and tore nuts in their fabric.

Two of the large aeroplanes exhibited had actually flown and attracted a large amount of interest on that account. They were the Curtiss-Herring of Whipple Hall of the Pacific Aero Club and the beautiful large monoplane of George Rose of the Pacific Aero Club. The latter has not made extended flights, but is reported to have scared the ground for a short distance.

The exhibits composed four full-sized aeroplanes (three monoplanes and one biplane), a balloon, a dirigible, gliders, models, kites innumerable, propellers, supplies and aeronautic accessories and a United States signal corps portable wireless set.

A novelty on the Curtiss was the 3-ft. extension of each end of the upper planes, as shown in photo. This was an idea of Mr. Hall's; he claims that the additional surface (30 ft.) permits a much slower speed in rising. The short beams or wing bars fit into the end sockets and a bracket fixes them to the end strut.

The little "Demoiselle" monoplane, also exhibited by Mr. Loose, was the hit of the show, its small proportions being somewhat startling to the visitor. The body (not imported) was equipped by Mr. Loose with an extra pair of skids at the rear of the planes. Power plant: A 4-cylinder Hall engine of 35 h. p., 138 lbs., driving a Coffin "Parabolel" propeller, a small Curtiss type radiator was placed at rear of motor, both being mounted on the single upper member of the triangular body, the motor being also guyed to the lateral wing bars. Dimensions and control similar to the original "Demoiselle" with the exception of lateral control, in which the Vendome front flaps are used. Single surface cloth tacked on with tape. Lateral beams underneath as in the Curtiss and Pfitzner.

On the whole, the machine lacked the finish and careful attention that characterized the large monoplane built by Mr. Loose himself. The latter machine was exhibited without the motor. Its beautiful lines were admired by everyone. This was shown in the July issue.

An "all-steel" monoplane was exhibited by A. Soring, the ribs even being of small tubing. Surface, 240 ft. Weight, 200 lbs. without power plant, cloth or operator. Three-wheeled chassis, rear rudder turning with rear wheel, which also carries a supplementary surface, to the rear diagonal edges of which are attached the two separate flaps of the elevator. Lateral control by ailerons. One lever control.

A most curious oddity was the exhibit of Israel Baylis; it might appropriately be termed the paradox of the show. Whereas all other exhibitors seeked to eliminate weight, in this case weight was a desirable factor. The model (see photo), about 2½ ft. square, weighs 60 lbs. and has two wagon springs fixed to the base, between the ends of which (one on each side) is pivoted a heavy pendulum. This is to be driven, at a high speed, by gears and chains from the motor. The inventor claims that a reaction of the machine from the rapid pendulum blows on the spring ends, which cause it to lift.

President J. C. Irvine of the Pacific Aero Club exhibited his battle-scarred balloon, "Queen of the Pacific." Capt. P. A. Van Tassel was early on the scene with a new 8,000-ft. dirigible, 14 ft. diameter by 63 ft. long.

Gliders were exhibited by William Krelling, Ohrt Bros., M. Gunzendorfer and J. Musser, C.

Demoiselle Built By Geo. H. Loose.

Gray and E. Speyer, R. Hughson and L. Schultz, and the Shaffer Aero Manufacturing and Supply Co.

Kites, including a Philippine war kite, used as a target at 600 metres, were displayed at one end of the hall, while at the other were the large number of models. Several of the well-known "parabolel" propellers were exhibited by A. Coffin.

The Pacific Aeroplane and Supply Co. exhibited several samples of fine work in wing construction.

The Shaffer Aero Manufacturing and Supply Co. had a large exhibit of aero supplies, includin gliders, wheels, tires, propellers, wire, laminate ribs, tanks, etc. The AERONAUTICS stand by th above company was visited by many of its weste friends.

The Pacific Aero Club reception room and boot were well crowded; many new members hav joined since the show.

William Kreling won the glider cup. His glid was a beautiful machine "de luxe."

Model contest winners were Waldo C. Brow Fred Hotchner and Harold Willots.

Aeronautic Calendar for U. S.

July 9-16—Toronto, Can., aviation meet.
July 16-17—Grand Rapids, Mich., J. C. Mars.
July 16-17—Decatur, Ill., Chas. F. Willard.
July 23-28—Omaha, Neb., G. H. Curtiss, ~~C. F. Willard~~, J. C. Mars, McCurdy Ely
Aug. 6-8—Pittsburg, Pa., J. C. Mars, ~~McCurdy~~
Aug. 12—Indianapolis, Ind., balloon race.
Sept. 5-10—Lincoln, Neb., exhibition flights by Wright aviators.
Sept. 5-10—Hamline, Minn., exhibition flights by Wright aviators.
Sept. 12-16—Milwaukee, Wis., exhibition with one Wright machine.
Sept. 17—Indianapolis, Ind., elimination race for Gordon Bennett balloon race.
Sept. 19-24—Detroit, Mich., Wright exhibitio flights.
Sept. 26-30—Trenton, N. J., exhibition fligh by Wright aviators.
Oct. 1-8—Springfield, Ill., exhibition flights l Wright aviators.
Oct. 3-8—Sedalia, Mo., exhibition flights l Wright aviators.
Oct. 8-13—St. Louis, Mo., Aero Show.
Oct. 15-23—Mineola, N. Y., Gordon Bennett an other aviation contests.
Oct. 17—St. Louis, Mo., Gordon Bennett balloo race.
Dec. 1-8—Chicago, Ill., aeronautical exhibitio of A. C. of Illinois.

Chronology of Foreign Happenings

June 3. Marcel Hanriot, aged 15, flew a Hanriot monoplane cross-country, Betheny to Mourmelon, 35 kil.

June 5. Capt. Burgeat, French military flyer, using an antoinette, flew 1 hr. 5 m. at Mourmelon and over surrounding country.

871 MILES FLOWN IN THREE DAYS.

June 6. The Anjou meeting closed this day. The total distance flown by six aviators was 1,403.4 kils. (871.5 miles). Sommer machines first and second; Farmans third and fourth; Bleriots fifth and sixth. Greatest distance flown without stop: Martinet (H. Farman), 168.2 kil.; Paillette (Sommer), 125.9 kil.; Dickson (H. Farman), 98.7 kil.; Legagneux (Sommer), 97.8 kil.; Aubrun (Bleriot), 31.3 kil. $8,800 in prizes divided. Martinet (H. Farman) won Angers-Saumur cross-country race (42 kil.) in 31 m. 35 s. (49.5 m. p. h.).

June 7. Marcel Hanriot flew back to Betheny accompanied by M. Niel in a Voisin, and Lieut. Fequent and Capt. Marconnet in a Farman. The first two landed at Betheny, while the other, bearing the officers, went on, over Rheims and back to Chalons, covering 98 kil. in 1 hr. 37 min.

June 8. Leon Morane (modified Bleriot XI fitted for two people) flew cross-country, Issy to Toury, with stop at Etampes, 93 kil., in 72 mins. flying time.

Verstraten (Sommer) carried a passenger for 55 mins.

June 9. Lieut. Bellenger flew a H. Farman 1 hr. Mourmelon.

WORLD CROSS-COUNTRY 2-MAN DURATION AND DISTANCE RECORDS.

June 9. Capt. Marconnet and Lieut. Fequent, two military pupils using H. Farman machines, flew from Chalons to Vincennes, 160 kil., time 2 hr. 30 m. With oil and gas the weight carried was 462 pounds. Capt. Marconnet held the map and took photos.

June 10. Dubonnet (Tellier) flew 120 kil. at Juvisy track.

2-MAN MONOPLANE RECORD.

June 11. Leon Morane (Bleriot) beat the world's monoplane passenger record, flying in a circle over Toury for 1:30:00.

June 11. At Juvisy meet, Dubonnet flew 65.36 kil. in 1:14:00; Didier (H. Farman), 57.8 kil. in 1:04:00.

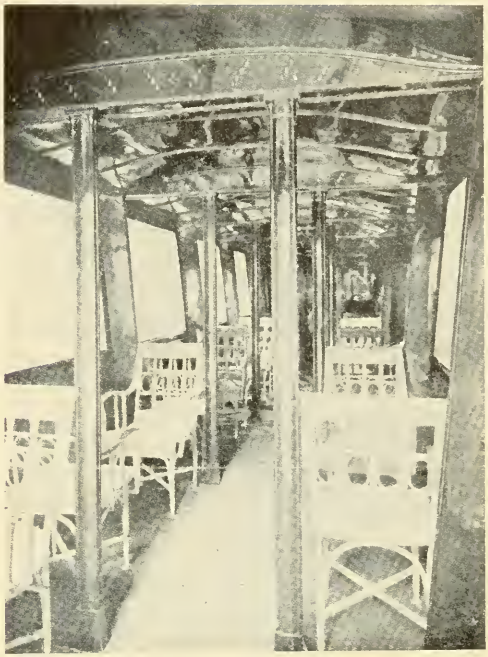
TWO-HOUR FLIGHT.

June 11. Budapest meeting closed. Total time 10 machines flew, 50 h. 16 m. 48 s., and still other machines flew not entered for duration prizes. This time runs from more than 12 hrs. for Nicholas Kinet (H. Farman) to 2 hrs. for Mme. de la Roche. Longest flight without landing prizes awarded as follows: Wagner (Hanriot), 2:03:46; Illner (Etrich), 1:45:40; N. Kinet (H. Farman), 1:44:50; Wachalowski (H. Farman), 1:13:29. The greatest distance in one flight was 137 kil. by Wagner.

June 12. Capt. Marie (H. Farman) flew for 1:10:00 and 1:05:00 on the same day.

June 19. The German Clouth airship sailed from Cologne over the French and Belgian frontiers unnoticed, landing at Etterbeck, near Brussels, Belgium. The distance covered was about 125 miles and the duration 5 h. 20 m.

June 20. Labouchere (Antoinette) flew from Mourmelon to Betheny. Recently while carrying a companion, at Chalons, Labouchere proposed a drink and proceeded to fly to a cafe at Mourmelon. Served, the return was made to the camp.



Passenger car of the "Deutschland" Airship

Sommer has delivered his first military aeroplane to the French army after a demonstration flight of 2:10:00.

PASSENGER AIRSHIP MAKES LONG TRIP.

June 20. Leaving Friedrichschafen the new aerial liner "Deutschland" (Zeppelin VII.) sailed to Dusseldorf, a distance of about 311 miles, the trip lasting 9 hours. Count Zeppelin was in command, and there were a dozen others on board. The new Zeppelin is similar to its recent predecessors, except that there is an inclosed gangway connecting the two cars and between them is the compartment for passengers. The walls are of mahogany covered aluminum and the furniture consists of wicker chairs. The length is 148 m. (485 ft.) and 14 m. in diam. The capacity is 19,000 cu. meters.

June 21. Tabuteau (M. Farman) flew 1:14:00 at Buc, covering about 108 kil. over nearby towns.

June 23. Lieut Fequent flew from Issy to Vincennes on his H. Farman.

June 24. The "Deutschland" undertook its first regular passenger trip, with a crew of 12 and 20 passengers. Three hours were spent cruising around Dusseldorf. During part of the time there was wind and rain, but the elements seemed to have no bad effect.

2775 MILES FLOWN IN A WEEK.

June 25. Rouen meeting closed. The total mileage flown was 2775 miles (4469 kil.) divided among various machines as follows: H. Farman 1095, Bleriot 900, Antoinette 713, Tellier 507, Hanriot 489, Demoiselle 261, Sommer 411, Breguet 36, Voisin 57 kils; $30,654 distributed in prizes. The greatest total of flights by one man was 464 miles, by Bertram Dickson. The longest distance flown without stop was by Dickson (H. Farman), 141 kil., in 2:27:44.

AIRSHIP "DEUTSCHLAND" DESTROYED.

June 28. The Deutschland, carrying a crew of 12 and 21 passengers, left Dusseldorf for a 3-hour trip. One of the propellers stopped after 2 hours, and a storm rapidly came up. Finding it

impossible to reach Munster, Osnabruck was made for, but as the ship had been in the air 9 hours, the gasoline supply gave out, and left the vessel at the mercy of the storm. It finally settled down on the trees of a forest, and the passengers escaped with their lives.

June 29. Lieut. Savoia made a cross country flight of 40 miles from Centocelle, Italy, and the day following one of 22 miles in his H. Farman.

June 30. S. F. Cody tested his new biplane. The twin propeller system has been abandoned. Two engines have been fitted to drive a single propeller. Either can be operated individually. After making two circuits of Laffan Plain a gust of wind caused the machine to fall, and Cody was pinned unconscious in the wreckage. The two engines are of the 50 h. p. 4-cyl. Green type.

June 30. Labouchere (Antoinette) and C. L. Wachter, (Antoinette) flew from Mourmelon to Betheny for the meeting there.

July 2. The Wolverhampton, England, meet closed. Grahame-White (Farman) was longest in the air in one flight, 1:15:38; L. D. L. Gibbs (Farman) second with 1:13:5.

$5,000,000 FOR AVIATION.

July 2. The Italian Chamber of Deputies has granted about $5,000,000 for construction and maintenance of aeroplanes and airships.

FRENCH ENTRIES FOR INTERNATIONAL.

July 3-10. Seventy-six entries in the Rheims meeting. Monoplanes entered, 29. Leblanc, Latham and Labouchere were picked to represent France in the international at Mineola, L. I. In Leblanc's flight he broke the 5, 10, 50, 60, 70, 80 and 90 kil. speed record.

BARONESS MEETS WITH ACCIDENT.

July 8. Baroness de la Roche met with an accident at the Rheims meet, suffering severe injuries. She had apparently become unnerved by the close passing of two other aeroplanes. One of the passing aeroplanes flew directly over her, and it is thought that the draft from its propeller made trouble for the baroness.

GRAHAME-WHITE FLIES 90 M. CROSS COUNTRY.

July 11. Grahame-White flew a distance of 90½ miles in to the Bournemouth aviation grounds where a meet was in progress, in 2 hours 35 minutes. On July 7 he started from London to make the entire distance, but an accident compelled him to land after going but a short distance.

BRITISH ALTITUDE RECORD.

J. A. Drexel made two ascents on July 11 at the Bournemouth meet of 1950 and 2493 feet altitude in his Bleriot. On June 20 he went up to 1070 feet.

New Prizes Abroad.

The London *Daily Mail* has announced the conditions for its new $50,000 prize. The contest is open to the entire world, to be held the second week of July, 1911. The winner will be he who starts from a fixed point near London and completes a 1,000 mile course laid out over various cities in England and Scotland, and making a complete tour of Great Britain.

The Automobile Club of France offers a $30,000 "Grand Prize" for an aeroplane flight from Paris to Brussels and return, divided between the three who cover the course in the fastest time before January 1, 1911, the machine to carry two people, or two with ballast enough to make up a weight of 150 kgs. Must be made within 36 hours, starting from Issy. One descent at Brussels is obligatory. To take not more than 3 hours.

$10,000 is offered for dirigibles over a course Paris to Rheims and back, given to the pilot making the best time before January 1, 1911. Start and finish at Vincennes. One descent obligatory at Rheims, where an extra passenger must be taken up of a weight of 75 kgs. Duration of landing counts as part of the time.

M. Lazare Weiller, who was connected with the French Wright Syndicate, has offered the War Minister of France a $5,000 prize for a dispatch carrying competition between military aviators, carrying a passenger.

The H. Farman instruction biplane covers practically every day a total distance of 200 kils. with two on board.

AEROPLANE RISES FROM WATER.

Henri Fabre, with a monoplane of 50 h. p., Gnome engine, mounted on 3 hydrocurves, has been able to fly a distance of 5 kils., rising and alighting on the water. The speed attained was 100 k. p. h. The speed is 14 m.

One hundred and eleven aviation pilots here received licenses from the Aero Club of France. These are divided among various makers of machines, as follows: (Mme. de la Roche is the sole woman pilot.)

Bleriot 24; Curtiss 2; R. E. P. 1; H. Farman 30; Voisin 15; M. Farman 1; Wright 10; Antoinette 9; Demoiselle 2; Sommer 4; Hanriot 2; Tellier 1; Nieuport 1; Breguet 1; Sanchez-Besa 1; Goupy 1; Unnamed 6.

Aeroplane and Airship Casualties.

VICTIM OF HIS OWN COURAGE.

June 18. Thaddeus Robl, who learned to fly a Farman, was killed at Stettin, Germany. The wind was blowing and no aviator would fly. The crowd became angered, and called for Robl, who attempted a flight. Descending from a height of 200 feet, a gust caught him and he was buried under the wreckage, with his neck broken. He expired in a few moments.

WACHTER'S AEROPLANE FALLS.

At the opening of an aviation meet at Rheims, July 3, Chas. Louis Wachter met his death in an Antoinette aeroplane. The wings seemed to fold up, letting the machine drop without resistance to the ground from a considerable height.

Oscar Erbsloh

DIRIGIBLE EXPLODES.

On July 13, Oscar Erbsloh, the winner of the Bennett balloon cup at St. Louis, 1907, with four companions fell from the non-rigid dirigible "Erbs-

loh" when it was at a height of over 900 feet. The cause is stated to be the bursting of one of the ballonets. It is thought possible that the expansion of the gas at the high altitude caused the bag to burst.

The airship had a cubic volume of 2900 cubic meters, was 53.2 meters long and 10 m. diam., driven by a 125 h. p. Benz motor. The speed was 29 m. p. h. and could carry 6 people. The propeller was forward, of 2 blades, and 4.5 meters diam.

DEATH OF ROLLS.

The Hon. C. S. Rolls met with his death at Bournemouth, Eng., July 12, while flying his Short-Wright machine in a contest for landing nearest to a predetermined spot. Just what happened it is impossible to determine at this moment. The motor had been shut down previous to the glide down.

The Hon. C. S. Rolls, son of Lord and Lady Llangattock, has been one of the foremost in aeronautic sport. When the automobile came into being he was an ardent supporter, winning several races. He has made more than a hundred balloon ascents, and last year took up the aeroplane. Recently he jumped to the front with hour flights and more, crossing the English Channel and returning without stop.

OTHER DEATHS IN POWER MACHINES.

Sept. 17, 1908, Lieut. T. E. Selfridge, at Washington.
Sept. 7, 1909, E. Lefebvre, Juvisy, France.
Sept. 22, Louis Ferber, Boulogne, France.
Dec. 6, A. Fernandez, Nice, France.
Jan. 4, 1910. Leon Delagrange, Bordeaux, France.
Apr. 2, Hubert Leblon, San Sebastian, Spain.
May 13, Hauvette Michelin, Lyons, France.
June 18. Thad. Robl, Stettin, Germany.
July 3, C. L. Wachter, Rheims, France.
———, Zosely, Budapest.
July 15, Daniel Kinet, Brussels, Belgium.

THE NEW FARMAN MONOPLANE

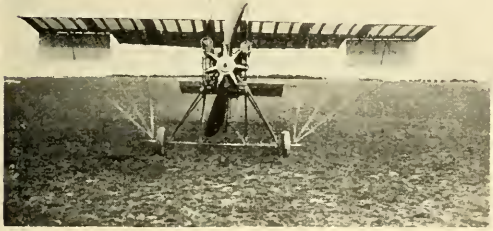


Photo by Edwin Levick, N. Y.

Henry Farman has begun trials with a new monoplane. The spread is 23.6 ft., depth 6 ft. 6 in.; the tail measurements are 9 ft. 10 in. by 3 ft. 3 in., and the overall length of the machine is 26 ft. 2 in. The supporting surface is practically 190 sq. ft. So far as can be gathered from examination, the wing curvature is the same as for the standard biplanes. The tail is 9.8 ft. by 3.28 ft. The total weight of the new machine is given as 660 lbs.

Lateral stability is secured by two ailerons of the familiar Farman type. The Farman is the only successful French monoplane employing ailerons, the Antoinette having abandoned them in favor of flexing the wing, Bleriot, Tellier and Hanriot never having employed them. The horizontal tail member has one half of its surface fixed and the rear portion hinged to form an elevator. On the more recent biplanes the extremity of the upper tail member has been made pivotable, to operate in conjunction with the front elevation rudder, but this movable surface was only about one quarter of the whole; on the monoplane it is half the depth of the plane. The rudder is mounted entirely above the horizontal plane, and had ahead of it a triangular shaped pin.

The fuselage is a triangular structure united at the forward end by steel girder work in the form of a cross, the center of which serves to receive the mounting of the fixed shaft of the Gnome motor. The four main frame members are united by suitable stanchions, and trussed with piano wire; they are not united at the rear. The wings are not mounted directly on the fuselage, but are carried almost two feet above it. This places the pilot, the motor, and the petrol and oil tanks on a lower plane than the bearing surface. A triangular structure receives the wings, and at the same time serves for the attachment of the running gear.

At right angles to the longitudinal frame members are two vertical members, attached to the steel girder work on the fore end of the fuselage, and mounting above the level of the wing and descending considerably below the level of the frame. From the lowest point of these two uprights are two similar members inclined towards the rear, attached to the two longitudinal members of the fuselage, and receiving on their upper extremities the rear transverse girder of the wing. This, as can readily be seen from the illustration, forms a triangle—or really two triangles, one at each side of the fuselage—the apex of which is near the ground, and receives the axle of the running wheels and the base above the main plane.

The rear plane is mounted directly on the fuselage, with the hinged portion overhanging in order to allow free movement. The rudder and fin are mounted above the fuselage, and consequently above the horizontal plane. There are neither shock absorbers or skids, the aeroplane starting on two small diameter pneumatic-tired wheels mounted on a steel axle passing through the points of the two triangles already described. Towards the rear of the aeroplane is a simple type of skid to prevent the tail from trailing on the ground. The pilot's position is within the fuselage, just to the rear of and below the level of the wing.

The fuselage is not encased. The motor, of course, is in the usual position ahead, overhanging the extremity of the fuselage. It is the standard type of Gnome, with a two-bladed Chauviere propeller. Placed below the level of the wings, the pilot has the advantage of being able more correctly to estimate his distances for landing than is possible when carried slightly above the wing level. Further, this advantage is gained without any loss of protective material in case of a rough handling, there still being the motor and half the length of the fuselage ahead, the wings on each side, and the running gear below, to take the shock before the pilot can be reached. The machine's first appearance in competition will be interesting.

News In General

International Aviation Tournament at Mineola.

The national and international aviation meeting for 1910 will be held near Mineola, L. I., about one mile east of the present aviation field, beginning Oct. 15 and closing Oct. 23. The international speed contest for the Gordon Bennett trophy will take place on Oct. 22.

For this contest there will be at least 11 competitors—three from France, three from England, one from Italy and three from America. Elimination races for the selection of the French team were held in Rheims, July 5, when Latham, Leblanc and Labouchere were chosen. Latham uses an Antoinette and the other two Bleriots.

Grouped about the international speed championship contest will be an interesting program of events, including many novelties and extraordinary feats for aeroplanes. This program is now being arranged, and will be announced as soon as possible. Cash prizes amounting to about $50,000 will be awarded for the most important achievements, with several special prizes for other events.

Contracts are soon to be awarded for the building of the grand stands, aerodromes, etc., and the field, two and one-half miles in length by one mile in width, is now being put in proper shape.

In addition to the regular challengers for the international trophy, it is expected that a large number of foreign and American aviators will take part in the general program. Inquiries have already been received from many European aviators, and no doubt many machines will actually fly over the course during the meet. It has not yet been determined who the American cup defenders will be, but it is expected that Glenn H. Curtiss, winner of the trophy last year, will be one of the three.

Lawrence L. Gillespie of the Aero Club of America, chairman of the subscribers' committee, reports good progress in raising the $250,000 necessary to finance the meeting. The committee has appointed Gage E. Tarbell as general manager and Byron R. Newton as assistant manager, with offices at 320 Fifth Ave. Announcement of the prizes and program will soon be made.

Aviation Treaty Between Mexico and the United States First of Its Kind.

By E. L. Ramsey.

THE Foreign Office confirms the statement that negotiations are under way for the celebration of a treaty between Mexico and the United States for the purpose of regulating aerial traffic over the border line of the two countries with the special view of preventing smuggling.

So within a short time it will be illegal for an American to visit Mexico in an aeroplane or dirigible balloon, because it would violate the treaty which is being negotiated between the United States and Mexico.

Charles K. Hamilton has already crossed the Rio Grande at Ciudad Juarez and El Paso in an aeroplane, and the long flights that are now being made are sufficient notice that such events will not be remarkable in the future. This makes it necessary for the two governments to extend the provisions of their treaties regarding immigration and the collection of customs duties so that inspections may be made in the interior as well as on the border.

The officials of the State Department have made many favorable comments on the advantages to be derived from such a treaty.

AMERICANS TO FLY IN MEXICO NEXT FALL.

Joseph Hidalgo and Sparks M. Berry, of Los Angeles, have made proposals to take part in the centennial celebrations in Mexico City this fall. They propose to bring a number of aeroplanes, with expert aviators, dirigible balloons and several aerostats. This has given rise to new hopes on the part of Governor De Landa y Escandon of the Federal District to make this one of the drawing cards of the event.

The matter will be discussed by the national centennial committee, of which Mr. Landa y Escandon is the president, at the next meeting, and no reply will be given to either of the proposals until then.

Terms of Chicago-New York Flight Announced.

Dates have been set for the contest to be held under the auspices of the New York *Times* and the Chicago *Evening Post* from Chicago to New York for a prize of $25,000. The race will start October 8 from the Windy City.

A resume of the conditions follows: Entries may be made at any time after publication of the terms. There must be at least three competitors or no race. The start shall be 10 o'clock a. m., or as soon thereafter as may be, and shall be simultaneous, if possible. In case of bad weather, the start may be postponed from day to day until Oct. 15. Each entered machine must be in Chicago by Oct. 3 and give daily trial flights until start. The race must be finished within 168 hours from the start. Stops unlimited. Each entrant must have a verified record of one hour's continuous flight in Chicago between Oct. 3 and 8. Repairs may be made en route, but aviators must finish in the same machines they make the start. If the start is simultaneous, the first machine that reaches the finish within the rules will be adjudged winner, but in case the entrants start at intervals, due allowance will be made. A flight of equal or of greater length than the proposed course, prior to the race in this country, shall serve to invalidate its terms. The promoters of the event reserve the right to delegate the management of the affair to a recognized aeronautical society if such a course is deemed advisable.

Public school 77 of New York celebrated a "safe and sane" Fourth by having a free balloon ascension in addition to kite contests. It was not intended to be of the free variety, but the bag took charge of itself and sailed over to Maspeth, L. I.

An 18-ft. balloon was furnished by A. Leo Stevens and a generating plant was installed in the Central Park yard at 97th St. After inflation was complete, the balloon was guided over and under trees in a brisk breeze, up Eighth Ave. to 106th St., sustaining small holes in the journey. These were patched up, and the balloon, decorated with flags, was sent up at the end of a 2,000-ft. rope. In pulling the balloon down in the late afternoon, the rope broke and the balloon slowly went out of sight. Not being quite full, there was ample opportunity for the gas to expand. When found, it showed signs of having burst at a great altitude.

Clifton O'Brien of the Pacific Aero Club is flying a Farman type biplane with a 60 h. p. Hall engine.

St. Louis Aero Show.

That exhibits of complete aeroplanes and motors built expressly for aerial use will be the feature of the St. Louis National Aero Show, in the Coliseum, Oct. 8 to 13, is now assured by contracts for floor space which have been made by several well-known concerns, among them the agents for the Gnome motor, to which Paulhan and Farman attribute much of their success.

Complete aeroplanes and a new aero motor will be shown by the Aerial Navigation Co. of Girard, Kans. This concern has already completed three machines of the same type, which are reported to have been sold, and has now constructed three more.

The Aeromotion Co. of America (St. Louis) has taken space in which to exhibit the Gnome motor, and has reserved additional room for exhibiting two types of foreign-made aeroplanes for the agency of which they have about completed negotiations. Marc Seguin of the Aeromotion Co. cabled to the French house of Gnome motors before taking space and learned that the company could furnish a motor for exhibition at the time of the show. It will probably be the first Gnome motor shown in St. Louis.

Another type of rotary motor, which works upon practically the same principle as the French-made Gnome, will be exhibited by the Holmes Rotary Motor Co. of Denver, Colo. The Western Oil Pump and Tank Co. (St. Louis) has taken space, and will exhibit its regular line of tanks and self-measuring pumps, but in addition to this, it is rumored that this company will show something novel in the way of an aerial accessory which will be of considerable importance to airmen.

The Aeronautic Supply Co., which has just opened a store on Olive St. in the heart of the automobile district, will be another St. Louis exhibitor, showing practically everything for the construction of complete planes as well as the finished machines. This concern has already placed St. Louis in an important position as far as the aeronautic industry is concerned. It was the first aeronautic supply house in America, and it is said that its present number of clients is 3,000 people, embracing the entire country, Canada and Mexico.

The eight or ten airmen about to take part in the novice meet of the Aero Club of St. Louis are very much interested in the coming aero show, and have expressed their intentions to have exhibits there, provided they are successful in their work this summer.

Hamilton Tries Two Cycle Engines.

Charles K. Hamilton, who has split with Curtiss, has borrowed for temporary use the Curtiss type aeroplane built by Fred Shneider for G. E. DeLong of the Elbridge Engine Co. of Rochester, and expects to use it in demonstration flights at Mineola until his own high-powered racing machine is completed, which will probably be the first part of August. The De Long machine is equipped with an Elbridge two-cycle 40-60 h. p. engine, Bosch magneto and Requa-Gibson propeller, El Arco radiator and Hartford tires. This is the same machine which Dr. Greene flew at Rochester.

C. W. Bennett, who was associated with Messrs. Wilcox, McDonald and Carruthers in getting up the Montreal meet, has disposed of his interests and has joined hands with the Aviation Co. of Canada.

The Aviation Co. of Canada has been organized with offices at 291 St. Catherine St., Montreal, with the primary object of promoting so-called "meets," supplying fairs, etc., and has secured representation in the maritime provinces and the west.

John McGovern on June 17 delivered a panegyric an hour and a half in length, entitled "The United Brethren, Wilbur and Orville," at the Press Club of Chicago.

Rules for $15,000 Prize.

The rules for the Edwin Gould $15,000 prize have been formulated, and are, in short, as follows:

> For the most perfect and practicable flyer designed and demonstrated in this country, having two or more power plants, capable of working independently or in conjunction. File complete specifications and drawings with contest committee, *Scientific American*, 361 Broadway, New York, on or before June 1, 1911. Contest takes place July 4, 1911, and following days. Two machines must enter or no award.
>
> Before competing, applicant must have made flight at least one hour, using but one power plant, and must also in same flight drive engines alternately and together. Open to any gasless apparatus. No entry fee. Location of place of trial to be announced about June 1, 1911.

Kite Contests at Mineola.

Edward Durant is directing kite flying and model contests every Saturday at Mineola. Two score boys started the first of the series on July 4th for a cup offered by Mr. Durant. At the end of an hour many of the kites had escaped and the contest was brought to a close. The three prizes went to Frank Krug, John Kinsella and Carl Morehouse respectively.

Pennsylvania Club Has Grounds.

The Pennsylvania Aero Club is building six sheds at Clementon, N. J. Edward Augsberger is working on his machine in one shed, the Lesh aeroplane belonging to Herbert Hazzard is another and Louis Bergdoll who bought a Bleriot some time ago will probably use another shed. A meet is in anticipation for the Fall.

Armour Institute's Aero Course.

The rapid development of aerial navigation has led the Armour Institute of Technology to offer instruction in the more important branches of this subject. The object of the course is to prepare students for experimental and practical work in aeronautics.

The elements of what is known of the scientific principles upon which the art of flying is based are taught. Students are made acquainted with the work and results of the principal experimenters; and also with the methods of construction now used in successful air ships and aeroplanes, including motors. These courses are elective and open to Juniors and Seniors of all departments.

The subjects of instruction are:

AERODYNAMICS.

The work in this subject includes the study of fluid resistance, stream line forms, the economics of flight, the theory and efficiency of the screw propeller, and experimental aerodynamics. Published accounts of experiments, including the latest available, are drawn upon for data on which to base mathematical studies of the problems of flight.

Text-book: Lancaster, *Aerial Flight, Vol. I. Aerodynamics*, supplemented with lectures.

Two hours per week during the second semester of the Junior year.

AERONAUTICAL DESIGNING.

The studies include the stresses in the principal types of balloons, air ships, and aeroplanes now in use; and the designing and detailing of these structures.

Lectures with problems assigned for solution by the students.

Two hours per week during the first semester of the Senior year.

GAS ENGINES.

Elementary theory, construction, and practical working of light weight gas engines.

Two hours per week during the second semester of the Senior year.

Death of A. L. Pfitzner.

A. L. Pfitzner, who was employed by G. H. Curtiss to design the present 4-cylinder Curtiss engine, then building and flying a monoplane of his own and later experimenting with the Burgess aeroplane at Marblehead, Mass., on July 12, went out in a boat and shot himself, falling into the water. The boat was found adrift. In it was his hat and coat and a note asking the finder of the boat to return it to its owner. The reason for his act is thought to be despondency. His loss is keenly felt by all those who knew him.

Mr. Pfitzner had been fairly successful in flying the Burgess aeroplane, and had made numerous flights on his own machine, as recorded in AERONAUTICS. On July 9 he made a flight of about 3 miles. When directly over the river at Plum Island, where all of the flights are being made with the Burgess machine, a gust of wind hit the machine and both the aviator and the aeroplane landed in the water.

On July 8 he made a flight of a couple of miles and then landed, due to the overheating of the engine.

Meets Death in Glider.

Eugene R. Speyer, of San Francisco, Calif., a young lad student, who with his "pal," Carlton Gray, had built a biplane glider, was killed on June 1 during his first experience at gliding, while towed by an automobile. Evidently frightened by the speed and a contrary gust of wind, he turned his front rudder down and the machine hit the ground and turned a somersault, breaking the boy's ribs and resulting in his death a few minutes later in the hospital. Speyer was quite insistent on being the first to try the machine and would not even toss a coin for choice.

The Wright Suits.

New York, July 1. The U. S. Circuit Court of Appeals yesterday denied the motion on behalf of the Wright Company asking that the Curtiss concern put up a bond to protect the petitioner from loss in the event of winning the patent suit. The petition sets forth the loss being done the Wright Company by the flights of Curtiss and Hamilton and others using Curtiss machines. In the last issue the dissolution of the injunction against Paulhan and Curtiss was announced.

The suit against Saulnier has been dropped as he left the country. Pressure of work that has seemed more important has prevented suits being brought against Harmon and other alleged infringers but the matter is not being held open awaiting final decision on the original suits. The Wright Company in the near future will proceed against every infringer who is injuring its business.

The Wright Co. has filed a demurrer to the action brought by Charles Lamson alleging infringement, stating that the bill of complaint does not show whether the infringement was committed by the defendants jointly or severally, and that it does not aver execution of the letters patent according to law.

WRIGHTS MADE DOCTORS OF LAW.

Oberlin College has conferred upon Orville and Wilbur Wright the degree of Doctor of Laws.

Balloon Races Off.

The balloon race scheduled at Peoria, July 5-6, was called off. A storm upset the plans for the St. Louis race on June 6-7 and the balloons had to be deflated to save them.

Octave Chanute, who was taken ill in Paris last month, is reported in a cablegram to his son, C. D. Chanute, No. 6047 Jefferson Ave., Chicago, to be better. The message says: "No cause for alarm."

CLASSIFIED ADVERTISING

TYPEWRITERS.—All makes. Caligraphs $6.00; Hammond, Densmore $10.00; Remington $12.00; Oliver $24.00; Underwood $30.00. 15 days' free trial and year's guarantee. Harlem Typewriter Exchange, Dept. F 18, 217 West 125th St., New York City.

AEROPLANE—Position wanted by woodworker and mechanic experienced in aeroplane and gas engine work. DAVIS, care of AERONAUTICS.

NO INFRINGEMENT—I am patenting design of aeroplanes, with no vertical rudder, which does not conflict with Wright patent. Need moderate capital to build. EXPERIENCED, care of AERONAUTICS.

BALLOON FOR SALE—New, 35,000-ft. balloon in fine shape. Full equipment and instruments. Cost $750. What will you pay or trade? EUGENE BROWN, Peoria, Ill.

FARMAN AEROPLANE—For sale cheap. The identical Farman aeroplane which won endurance prize at Rheims, France, for flight of over three hours. New power plant. J. W. CURZON, Hawthorne Aerodrome, Hawthorne, Ill.

THE "WHITE ROTARY" ENGINE WILL MAKE YOUR MODEL FLY. WRITE ABOUT IT. MINIATURE AEROPLANE WHEELS, RUBBER TIRED, VERY STRONG AND EXTRA LIGHT. SUPPLIES FOR YOUR MODEL. WHITE AEROPLANE CO., 15 Myrtle Ave., Brooklyn, N. Y.

FOR SALE—One 110,000 cubic foot balloon, holder of world's speed record. Also one 40,000 cubic foot balloon complete. Make offer. C. A. Coey, 1710 Indiana avenue, Chicago.

WANTED.—Capital to develop or construct "Man-Carrying Aeroplane," entirely original invention on new scientific principles. Patents granted in all civilized countries on miniature models which will be sent to interested parties for the price of one dollar. No other miniature flying machine stands comparison in its simplicity and stability of construction and wonderful action. Will fly under any condition of wind. For further information write E. EICHENFELD, No. 11 South 7th St., Minneapolis, Minn.

MECHANICAL ENGINEER wishes position as charge over aeroplane building; has 7 years' experience in aeroplanes, motors and experimental work. Address M. E., c. o. AERONAUTICS.

Having developed a totally new device for automatically balancing and steering aerial crafts, I wish to co-operate with a party, willing to furnish a few hundred dollars for building and demonstrating the same in a flying craft of any make.

This apparatus embodies principles and features of the highest importance and value, and will become fundamental and indispensable to aerial navigation.

Leading features of the apparatus:

Size 10 in. x 10 in. x 20 in. balances the largest craft, be it Wright, Curtiss, Bleriot, any dirigible, etc.

Possesses a positive, *non-oscillatable*, vertical (fundamental requirement) controller at all times that is perfect, and will never and can never be radically changed or improved upon.

Balances flying machines with their planes in tilted, warped, ascending, descending positions with utmost accuracy.

All steering mechanism combined in one hand wheel.

Flying in horizontal, ascending, descending, directions, circular, spiral curves of any radius by predetermined action on this one hand-wheel without ever interrupting the automatic balancing operations.

Patents applied for in several countries. An early demonstration of this invention, presented here without exaggeration, is the principal motive for advertising it. Address:

G. GAWLET.
2318 Sixth Ave., Seattle, Wash.

(Continued on page 75)

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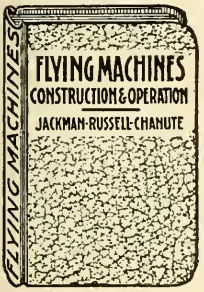

Flying Machines: Construction and Operation, is a new book announced by the Charles C. Thompson Co., of Chicago. It will be ready for distribution June 1. The authors are W. J. Jackman and Thos. H. Russell, both well known as writers on mechanical topics. Octave Chanute, C. E., a recognized authority on aviation, contributes a chapter on "Evolution of the Two Surface Flying Machine," which will undoubtedly be of interest and benefit.

While many valuable works on aviation are in circulation, the preliminary announcement of "Flying Machines: Construction and Operation," makes plain the fact that this is something different. In the words of the publishers it is a "show how" book for novices who wish to construct and operate flying machines. With this purpose in view it is strictly non-technical and easy to understand.

For sale by AERONAUTICS at $1.50 in leather; $1.00 in cloth.

Les Aeroplanes de 1910 by R. de Gaston, secretary of the French Society of Aerial Navigation. Preface by M. J. Armengaud, and a study on propellers by M. V. Tatin. Librarie Aeronautique, 32 rue Madame, Paris. Price 4 fr.

A technical study of the principal aeroplanes of 1910, usually showing drawings, which gives in brief space very complete data, figures, scales and comparative tables. This is a work of real value to the experimenter and to the student of aviation.

The Sky-Man is the title of a new and absorbing book just brought out by The Century Co., New York. A pleasure yacht goes up into the wilds of the frozen North, searching for some signs of a lost vessel which contains an Arctic explorer and his party. On board the yacht is a young girl, Jeanne Fielding, the daughter of that explorer. Up into the same region of the North comes a young man, Philip Cayley, who has long been an outcast from civilization, because of a crime of which he was not really guilty. He has taught himself to fly with a pair of giant wings whose motive force is the muscular power of his own body. Wild chance and a quick succession of stirring adventures leave the "sky-man" and the young girl alone to fight privation and darkness through an Arctic winter. Of course, there is a villain in the case, a half insane Norwegian sailor, whose stealthy appearances make life miserable for Philip and Jeanne.

It is a book which appeals to the imagination—a story not sociological nor with a problem in it, but of the kind of adventure that one finds in "Robinson Crusoe" and "Treasure Island." For sale by AERONAUTICS at $1.30.

The Epitome of the Aeronautical Annual. Mr. James Means, who published the "Aeronautical Annual," in 1895, 1896 and 1897, has completed an epitome of these volumes, all three numbers of the Annual being now out of print. Mr. Means' Annuals have been of great value to experimenters but are not so well known to present-day enthusiasts. A vast amount of good information will be obtained from this book. The principal articles of the three previous volumes are incorporated in the epitome, with several new ones. The article by Octave Chanute on "Soaring Flight," printed in AERONAUTICS for April, 1909, has been substituted for Mr. Chanute's two previous articles in the Annuals. Prof. A. Lawrence Rotch has written a chapter on the relation of the wind to aerial navigation, and the history of the Blue Hill Observatory is given up to date. For sale by AERONAUTICS at $1.12.

The Art of Aviation, by R. W. A. Brewer, a "Handbook upon Aeroplanes and their Engines," with notes upon propellers. 8vo., cloth, 253 pp. fully illustrated with 12 large plates. This is a very practical book and will be of value to anyone who can make use of higher mathematics, although the theoretical is done away with. The tables of weights lifted at various angles, wind pressures, etc., will be found of value. Contents include: Comparison of Monoplanes and Biplanes; Form, Support, Stability, Weight and Horse Power; Herson's Machine; Engine Problems (This is quite exhaustive); Descriptions of Engines (Many engines are described in detail); Propellers, Relation between Pitch Speed, Thrust and H. P.; Efficiency of Propellers by Various Methods, Tables; Materials of Construction; Details of Manufacture; Successful Monoplanes; Biplanes; Wright and Voisin Compared, Tables of Leading Machines; Progressive Records; Art of Flying, Gliding, etc. Price, $3.50, from AERONAUTICS.

How to Build an Aeroplane. This is a new book translated from the French of Robert Petit by T. O'B. Hubbard and J. H. Ledeboer. The author, who is an eminent French engineer, has made a personal study of the method of adopting by various European manufacturers, and has tried to incorporate in the book such knowledge of methods adopted by constructors as will be of benefit to those building.

The contents include: General Principles of Aeroplane Design; Theory and Calculation (Resistance, Lift, Power, Calculations for the Design of an Aeroplane, Application of Power, Design of Propeller, Arrangement of Surfaces, Stability, Center of Gravity, etc.); Materials; Construction of Propellers; Arrangement for Starting and Landing; Controls; Placing Motor, etc.; The Planes (Curvature, etc.); Motors.

Le Constructeur de Petits Aeroplanes, par M. R. Petit. A large pamphlet containing working plans of four small easily flown aeroplane models with complete directions for their construction. Published at 30 cents by Librarie Aeronautique, 32 rue Madame, Paris.

L'Aeroplane de l'Avenir, par Henri Picq. A brochure with drawings and plans of a freak aerial omnibus. Price 30 cents, at Librarie Aeronautique, 32 rue Madame, Paris.

The Art of Flying, by Thomas Walker, is the third of the series of classics being published serially by the British Aeronautical Society. This may be had from King, Sell & Olding, 27 Chancery Lane, London, England, at 30 cents.

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of the Famous

WRIGHT
FLYERS

¶ Both 'planes and motors built entirely in our own factory

THE WRIGHT COMPANY

Lighter Gas for Balloons.

A new German invention of value for free balloons is reported by Consul Thomas H. Norton of Chemnitz:

Illuminating gas is forced through long tubes, maintained at a very high temperature. Most of the carbon in the hydrocarbons is thus separated out and the percentage of hydrogen is largely increased, so that this gas constitutes 80 per cent of the modified coal gas. At the same time it is deprived almost entirely of its characteristic odor, and freed from the presence of benzine, which exerts an undesirable solvent action upon the materials employed to render balloons impermeable. The most important change is that in buoyancy, as the specific gravity sinks from 0.44 to 0.225, or less than one-quarter the weight of air. This means that 1 cubic meter of the new gas can support a weight of 1 kilo (2.2 pounds). In coal gas, 1 cubic meter supports 0.7 kilo. A balloon with a capacity of 7,000 cu. ft., when inflated with the new gas, has a lifting power equal to that of a balloon of 10,000 cu. ft. charged with ordinary coal gas.

Wellman in the Air Again.

It has been announced that Walter Wellman and Melville Vaniman, who have made a number of attempts to reach the pole by airship without success, are now planning to sail from Europe to the States in the same ship, "America," used in previous expeditions. The London *Telegraph* and the New York *Times* are exploiting the attempt, agreeing to purchase all the news which Mr. Wellman can produce.

The Buyers' Guide

Trade Notes

TO OUR FRIENDS.—We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

The Call Aviation Engine.

A decided refinement in aeronautic engine construction is that adopted by the Aerial Navigation Co. of America, with headquarters at Girard, Kans., in the Call aviation engine.

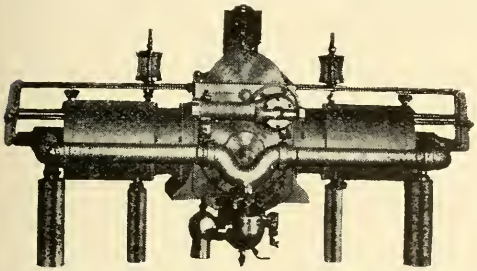
This is a regular opposed two and four cylinder engine of the usual four-cycle type, water cooled, 6-in. bore by 5¼-in. stroke; the two-cylinder engine developing 50 horsepower and the four-cylinder engine developing 100 horsepower at 1,900 revolutions per minute.

It is in the cylinder and cylinder head construction that the chief point of interest lies.

Even with the usual copper or other sheet metal water jacket, adopted by most aeronautic engine manufacturers to lighten the weight of iron cylinders, the great weight of cast iron either compels an unduly thin cylinder in order to keep down the weight, or, in case the cylinder walls are made of the requisite thickness for strength, the engine becomes very heavy.

On the other hand, the employment of steel for cylinders, as has been attempted by certain manufacturers, both in this country and Europe, has not, to say the least, met with signal success. Whether from the extreme thinness of the cylinder walls or to steel being less satisfactory in its bearing qualities than gray iron, engines of this construction, while giving satisfactory short runs, have failed in endurance tests.

In the Call engine the cylinder walls, piston heads, valve cages, valve seats, as also all other parts exposed to the heat of explosion chamber, are constructed of a special high-grade vanadium gray iron, while the outer cylinders and cylinder



heads, comprising also the water jacket, are constructed of a special high-grade alloy of aluminum and magnesium called magnalinm.

Unlike other constructions in which the use of an outer cylinder of lighter metal with an inner cylinder or bushing of gray iron has been attempted, it will be observed from the accompanying illustrations, first, that the iron inner bushing is surrounded throughout its entire explosion chamber length by the jacket water, without any intervening metal or joints, and, second, that no part of the lighter metal of which the outer cylinder and cylinder heads are composed is exposed to the heat of explosion chamber.

With proper water circulation, all danger of the overheating of the outer cylinders is thus avoided, and the proper adjustment maintained between the relative heat conductivity and expansive qualities of the two metals.

The gray iron bushings are machined to a perfect fit both inside and out, and are then pressed into the outer cylinder from the top. These bushings are of ample thickness throughout the length of explosion chamber, and below that are considerably reduced in thickness. As will be seen from the accompanying illustrations, an additional shoulder upon the inner cylinder at the top is machined to fit into a companion groove in the magnalium cylinder in order to make a thoroughly water-tight connection, while the spiral partitions of the magnalium water jacket extend inward to the iron cylinder, greatly strengthening it to resist the explosive stress encountered.

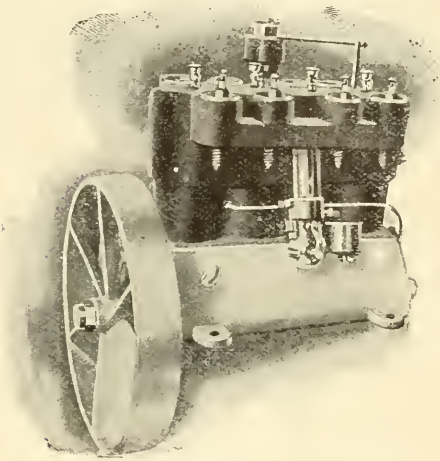
By the use of this lighter metal for the main outer cylinder, enormous strength of construction is permitted without undue weight. The magnalium cylinders are, in fact, of sufficient thickness to give a tensile strength of something like 150,000 lbs., while the cylinder base and cylinder heads are each secured by a dozen steel studs or cap screws ⅜ in. in thickness, having a combined tensile strength of 150,000 lbs.

In order to further lighten the engine, the valve cages, which are also of vanadium gray iron in one piece, are air cooled above the level of the cylinder heads; while below this and around the valve seats they are most efficiently water cooled. The crankcase and fittings not exposed to the heat of explosion chamber are also made of magnalium, similar to the material used for outer cylinders and cylinder heads, and the crankcase is thoroughly braced and ribbed in such a way as to give enormous strength combined with minimum weight.

Having thus secured lightness in the heavier engine parts, there has been no attempt made upon the part of the designer to secure lightness by the use of freakish material and insufficient sizes

Detroit Aeronautic Construction Co.

Builders of Light Weight, High - Power
MOTORS, PROPELLERS and RADIATORS



OUR motors combining compactness, simplicity and power, are the result of twenty years of practical gas engine construction. A card will bring our circular with full description.

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Four Cylinder 4½ x 4½ in. 30 to 40 H.P., complete with radiator and 6-ft. x 3½ ft.-pitch propeller, **$650** Weight per outfit 175 lbs.

Four cylinder 5x5 in., 40 to 50 H.P., complete with radiator and 7-ft.x4-ft.-pitch propeller **$750** Wgt. per outfit 200 lbs.

Six cylinder 5 x 5 in., 60 to 70 H.P., complete with radiator and 8-ft.x4-ft.-pitch propeller **$950** Wgt. per outfit 240 lbs.

LARGEST and MOST Complete

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37 models of aero motors alone

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Working Models
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MODELS BUILT TO ORDER
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SUPPLIES FOR MODEL BUILDERS:
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Special Notice!

WE have received so many inquiries for agency propositions and orders are coming in so fast, that our mail has grown to such an extent, that we find ourselves unable to keep up with our correspondence, but will fill orders and answer all letters as quickly as possible until we have increased our facilities still further.

Price List of Models and Parts is now ready, but it will be some little time before our **Supply Catalog for Full Size Machines** is ready for distribution as there are so many new things to list. In asking for catalog, please state which one you want.

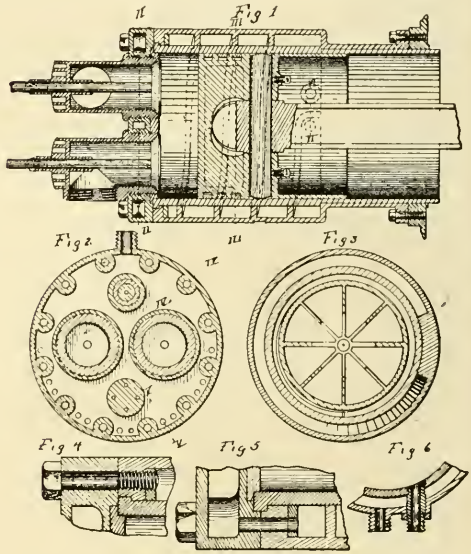
CHURCH AEROPLANE CO.

Main office and factory
123 South St.,
BROOKLYN, : : N. Y.
Chicago office, 49 Wabash Ave., H. S. Renton, Manager.

in the construction of piston heads, connecting rods, crankshaft and other like parts. The piston heads and rings are also made of vanadium gray iron. The connecting rods are the best grade of vanadium phosphor bronze, specially designed for strength, and the crankshaft is of the best grade of vanadium steel, solid throughout.

The valves are of large size and have unusually large valve lifts. Both the inlet and exhaust valves are 2 in. in diameter, and the valve lift is ⅜ in., giving free clearance. In addition to the main exhaust valves, a ¾-in. (inside diameter) auxiliary exhaust port, thoroughly water cooled, is placed on the bottom side of each cylinder. This exhaust port is allowed to open somewhat in advance of the main port, and thus draws the fire, furnishing an additional safeguard against the overheating of the main exhaust valve seats and bearings.

Both the main and exhaust ports are silenced, not by means of the usual baffle and muller plates, which crowd the exhaust back into the explosion chamber, but by a special silencer constructed of an inner casing of steel tubing, with V slotted mouth, over which an outer casing of aluminum tubing of considerably larger proportions is then fitted by means of a vanadium gray iron ring or thimble containing a large number of holes around its entire circumference. The force of the exhaust pumps the cold air through these openings, and by this means the gases are so cooled and shrunk by the time they reach the mouth of the silencer as to greatly diminish the deafening noise so pronounced a feature of other aviation motors.



ENGINE DETAILS.

Fig. 1 is a central horizontal section of the cylinder and piston of engine. Fig. 2 is a vertical section taken on the line II-II of Fig. 1. Fig. 3 is a vertical section taken on the line III-III of Fig. 1. Fig. 4 is an enlarged section at the outer end of the cylinder on the line IV-IV of Fig. 2. Fig. 5 is a similar view on the line V-V of Fig. 2. Fig. 6 is a vertical section of a part of the cylinder on the line VI-VI of Fig. 1.

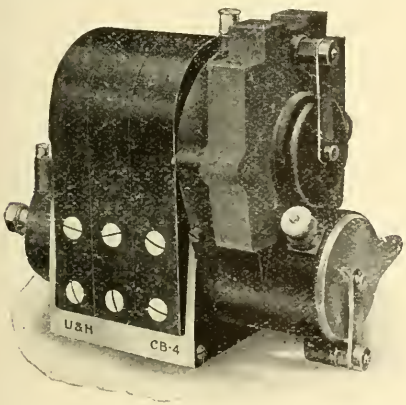
Especial attention has been devoted to securing the greatest possible cooling facilities. To this end the water jacket partitions are spirally arranged in such a manner that the jacket water passes four times around the cylinders during each circuit, and then over the entire surface of the cylinder heads. In addition to this, the engine is also equipped with a piston circulation pump instead of the usual centrifugal or gear pump adopted on automobiles, and copied by other

aviation engine manufacturers. This piston pump is positive in its action, and in connection with the spiral cooling flanges forces the jacket water four times around the cylinders during each 15 seconds.

While the manufacturers of this engine have endeavored to put upon the market a moderate priced engine, they have spared no pains and expense to make the engine of the very best quality, both in the character of its workmanship and finish. All the exposed parts of the engine not constructed of magnalium—a shining non-corrodible metal—are nickel plated, and the whole engine is polished to a mirror finish. The demand has been so large that the manufacturers have been compelled to increase their shop and foundry facilities from time to time, until they are prepared to supply the engine on short notice and in any numbers. The prices of the above engines are $1,000 for the 50 h. p. and $1,700 for the 100 h. p. respectively. These prices include all accessories, such as carburetor, pump, ignition and radiator facilities.

Two Spark Plugs to a Cylinder.

Messrs. Unterberg & Helmle, who make the famous U. & H. Master magnetos, have developed a new type of magneto, which meets with every requirement of speed service. In this new U. & H. racing magneto, two armatures are employed mounted tandem, and running in the same armature tunnel on one shaft. These armatures are fitted with two complete sets of windings, each set consisting of a primary and secondary winding. The most unusual feature of the magneto lies in the fact that but one interrupter is employed to break the primary circuit of both armature windings, and it is obvious that this arrangement must produce the high tension current in each armature winding, and must produce these two impulses at precisely the same instant.



TWO PLUGS FOR EACH CYLINDER.

The magneto is equipped with a compound distributor, each armature winding being connected by conventional means with the distributor. One set of plugs is connected with one distributor, and the other set of plugs, of course, connects with the other distributor. Two safety spark gaps are provided, one for each high-tension circuit, so as to eliminate any danger of damaging the windings, should the cables, leading to the plugs, be accidentally damaged.

As will be seen, the above unique arrangement overcomes all objections heretofore found in the use of two magnetos on racing motors. It is immaterial as to the amount of wear which takes place in the driving mechanism, or the amount of wear on the interrupter mechanism of the magneto, as the one break of the magneto interrupter operates for both windings. It is impossible to derange the magneto so that one set of plugs will receive the electric impulse before the other does, and tests made abroad with this new type of mag-

TO THE PROMOTERS OF THE
Coming Aeroplane Meets

YOU want exhibitions of Man-Lifting Aeroplane Kite Flying to interest the crowds while the aviators are not flying.

¶ High or even moderate winds will invariably keep the aeroplanists from flying until late each afternoon. Before then we will fill the air with hundreds of 9- and 12-foot Aeroplane Kites of every known kind. By flying these, dozens in tandem, enormous American flags, streamers and announcement banners about the meet can be lifted a half mile in the air.

¶ These scientific kites will fly all day and the displays will be a great attraction in themselves and will keep the crowds quiet and contented, when for any reason the aeroplanes cannot fly.

¶ At the Meet of the West Hudson Aero Club at Arlington, N. J., June, 1909, New York papers said, "The hundreds of kites in the air were a decided feature."

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NON-INFRINGING
AEROPLANES
Guaranteed to Fly
READY FOR EARLY DELIVERY
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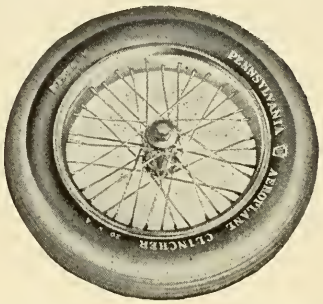

Clincher type only, which is the lightest and most satisfactory type for aeroplanes

SIZE	Weight complete
20x4 in.	6¼ lbs.
26x2½ "	6½ "
28x2½ "	7½ "
28x3 "	8 "
28x3½ "	8¾ "

Wheels also furnished for the above sizes

Pennsylvania Rubber Co., Jeannette, Pa.

BRANCHES:
New York—1741 Broadway; Boston—167 Oliver Street; Chicago—1241 Michigan Avenue; San Francisco—512 Mission Street: Los Angeles—930 So. Main Street.

The Acme of Engineering Skill

THE WORLD FAMOUS

Whitehead Motor

Designed by the Noted Engineer

GUSTAVE WHITEHEAD

No Bursting Cylinders—No Cams—No Springs or Valves to Work Loose

Construction of the utmost simplicity
Vibration negligible

Absolutely Nothing to get Out of Order

4 Cylinders (vertical), 8 port exhaust, 2 cycle

75	**H.P.**	**200 lbs.**	**Price**	**$1,400**
40	**"**	**145 "**	**"**	**$1,150**
25	**"**	**95 "**	**"**	**$950**

Including Bosch Magneto—30-day deliveries

GEORGE A. LAWRENCE, Mgr.,
Astor Theatre Building, New York, N. Y.

This motor has been exclusively adopted by C.& A. WITTEMANN, Aeroplane Manufacturers

neto show conclusively that the principle of operation of this new U. & H. Master Magneto is correct, and that while it is possible to secure fairly satisfactory results by connecting two separate magnetos to the motor, the use of the U. & H. racing magneto assures the maximum efficiency of the motor at all times, owing to the fact that it is impossible for the sparks in any cylinder to occur out of synchronism.

Aside from the principal features outlined above, the magneto is of the well-known U. & H. construction, employing the U. & H. non-adjustable interrupter, which is another detail of great interest to racing men, as it eliminates all possible chance of ignition difficulties, due to breaking or sticking of the pivots, springs, insulation, and other parts used on other types of interrupters. The armature and distributor of the machine are mounted on annular ball bearings, which effectually eliminates any possibility of trouble, due to lack of oil.

Buffalo Pitts Co. Building Aeroplane.

The Buffalo Pitts Company of Buffalo, N. Y., who are large engine builders, have under construction an aeroplane. In the course of their experiments with this machine over a number of years, they had occasion to try out certain models demonstrating new aerodynamic principles, and one of these models created so much interest in its operation, that they decided to make a flying toy novelty of it, which they have done, giving it the name of "Hi-Flyer" helicoptic flying machine, patented and copyrighted.

This little machine flies to a height of over 600 feet, and can be operated by any child. Shooting the "Hi-Flyer" is as much fun for grown people as for children, and is an excuse for outdoor exercise for everybody. It has been the sensation of the aviation meets throughout the country. It is used by aviators for determining the direction and velocity of the wind at high altitudes, and there is a special demand for it for this purpose at aero clubs, as well as for use on golf courses, and at amusement parks and beaches.

Kites Now Feature of Meets.

The kites of Samuel F. Perkins were a continual source of amusement and interest during the Indianapolis, Montreal and Toronto meets. These flew all the time and provided the public with something to look at when the 'planes did not fly. One Montreal newspaper featured an announcement of the kites on its news bulletins, illustrating the surprising value kites are lending to meets. These kites are sent up on many lines, singly, in tandem and other ways, and carry various banners, streamers and flags, advertising either the meet or articles of general use. If there is not enough wind for kites small balloons take the place of the kites and perform the same usefulness. The regular outfit numbers 100 kites of all kinds. A new stunt is a huge box kite made like an aeroplane, with rudders and propeller. In the air it looks exactly like the real thing and remains stationary in the air. In this it has it over its original.

Rinek Aero Mfg. Co.

The Rinek Aero Manufacturing Company of Easton, Pa., was recently incorporated with C. Norvin Rinek president and Frank Buckman, secretary-treasurer to conduct the light motor and aeroplane business heretofore handled by the machine department of the Easton Cordage Company. It was felt that on account of the rapidly increasing business handled by the machine department that a greater volume could be more efficiently handled by an organization devoted solely to aeronautics. The Rinek engine has found favor through consistent performance and good workmanship and material. Philip W. Wilcox, who has built a Farman-type machine at Mineola, speaks highly of the motor and the company's treatment of him.

Catalogues Wanted.

Manufacturers are requested to send catalogues of motors, propellers and accessories to Miguel Lebrija, Ave. del Palacio Legislative No. 42, Mexico, D. F., Mexico.

J. W. Curzon Starts Aero School.

J. W. Curzon who brought the first Farman aeroplane into this country and has made flights with it at the Indianapolis motor speedway, has established a training school where would-be aviators build actual machines. Those who want to learn to fly only will be accommodated at the Hawthorne racetrack, Chicago, where he has associated himself with M. L. Kasmar, author of "First Lessons in Aeronautics." An effort will be made to furnish graduates of the school with positions as aviators. Owners of machines will also be taught to fly them.

Three machines will be put out by the manufacturing end of the concern, all to be noninfringing and equipped with Elbridge engines. These are:

Curzon No. 1, small biplane, main planes 28 by 4 ft.; box kite elevator, size 6 ft. by 2 ft. each; single-plane stabilizer with slight camber; 17½ sq. ft. of surface; Curtiss type chassis and rudder.

Curzon No. 2, main planes 32 ft. by 6 ft., single-plane stabilizer with 18 sq. ft. of surface, single-plane elevator in front, 15 sq. ft.

Curzon monoplane, main plane 35 ft. by 7 ft. chassis similar to Farman; aspect same as Farman, but with bottom plane entirely removed with exception of middle section, which is made much narrower, and is lowered down so that the driver sits immediately above the wheels with engine at his back and propeller far above the engine, chain driven, thus placing man and motor far below the main lifting surface, which is 12½ ft. high, in order to maintain stability in all kinds of weather. Single-plane stabilizer behind as well as horizontal rudder in front, 15 and 18 sq. ft. respectively.

About Hartford Tires.

While to many people it may seem strange that a flying machine is equipped with tires, nevertheless in almost all cases this is true. The Curtiss machine used by Charles K. Hamilton in his flight in New Britain is fitted with three Hartford aviator tires 20 in. by 2 in. in size.

Hartford tires have been used since the first days of the bicycle, and have kept abreast of the procession of new inventions, and when the aeroplane became popular and tires were found a requisite part of their equipment, the Hartford Rubber Co. had three styles of tires to offer. At the first aerial show held in Madison Square Garden the Hartford company was the only tire exhibitor, showing at that time its aviator, aeroplane and aeronaut tires.

These tires are pneumatics, mostly in small sizes and of special construction to afford all the resiliency possible, as this is necessary to aid the machine in starting from the ground—and yet the tread must be very durable and of a certain degree of toughness to withstand contact with obstacles which may come in the path of the aeroplane.

There are already in this country more than a hundred flying machines fitted with Hartford tires. Recently a good-sized shipment was made to the Curtiss factory.

Shaffer Supply Co. Absorbed.

The Shaffer Aero Manufacturing and Supply Co. of San Francisco has been absorbed by the California Aero Manufacturing and Supply Co. Roy Scott, a well-known automobile man of San Francisco, is now a partner in the rapidly growing business.

The new salesroom, factory and office at 441 and 443 Golden Gate Ave. is already a headquarters for the aeronautically inclined on the Pacific Coast.

AEROPLANES

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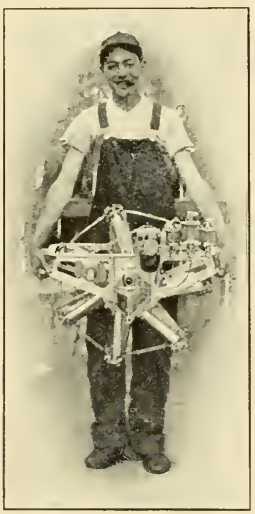
MOTORLESS FLIGHT

THE next great achievement in aviation may be MOTORLESS FLIGHT.

Many eminent engineers and physicists believe it to be attainable by man. We know that it is performed by the birds. Read the article entitled "SOARING FLIGHT," by OCTAVE CHANUTE, in the EPITOME OF THE AERONAUTICAL ANNUAL. This EPITOME contains also articles by CAYLEY, WENHAM, LILIENTHAL, MAXIM, LANGLEY and others who laid the foundations of the science of aviation. 224 pages, 18 plates. Price $1.00; postage 12 cents. W. B. CLARKE CO., 26 Tremont St., BOSTON.



HOLMES ROTARY MOTOR

7 Cylinder

30-35 H. P.
70-80 H. P.
3 lbs. per H. P.

Superior to any Aviation Motor built in this or any other country.

A. D. Mackay
General Sales Agent
First National Bank Bldg.
CHICAGO

Roebling Aviator Cord

Made of the highest strength wire drawn from special steel
The strongest and lightest cord procurable

JOHN A. ROEBLING'S SONS CO., - Trenton, N. J.

They report a large demand for their laminated ribs, which are carried in stock and made to order, the four-ply 5-ft., 5-ft. 6-in. and 6-ft. 6-in. lengths being favorites. They are now filling an order for ribs of the exceptional size of 8 ft. 6 in.

The 20-in. aero wheel made by this company is replacing a number that have "dished" its 7-in. hub, steel rims and heavy spokes, making it practically unbreakable. Regularly equipped with ball bearings. Friction bearings on order.

They are now placing on the market a knock-down plane, or rather a biplane, carrying surfaces 30 ft. by 5½ ft. The outfit includes laminated main beams and ribs, struts, sockets, joints and rib connections, to which can be attached any sort of rudders and chassis, one of the three types made by this company, or by the buyer.

Mr. Cleve T. Shaffer, whose technical descriptions AERONAUTICS' readers are familiar with, will be consulting aeronautic expert for the firm.

The following agencies have been secured: Whitehead motors, Detroit 20-30 motor, Palmer & Goodyear aero tires, Bosch magnetos.

Elbridge Engines Improve.

Mr. A. P. Warner of Beloit, Wis., the first amateur to fly in this country with a Curtiss machine, has announced his intention of building a new machine after ideas of his own during this summer. He expects to equip it with an Elbridge "feather-weight" engine.

Very rapid advancement is being made in the design and construction of the Elbridge "feather-weight" engines. Fundamentally the engines remain the same, but drop forged steel connecting rods, new pistons and a more efficient system of manifolds have improved the engines in both appearance and efficiency. The engines now being turned out at the rate of one each day are said to deliver 15 to 20 per cent. more than rated power. Regular deliveries are now being made in 10 days after receipt of orders.

Willis Co. Removes.

The E. J. Willis Co., dealers in aero supplies, has removed to larger quarters at 85 Chambers St., New York.

Harmon Uses Pennsylvania Tires.

One of the Herreshoff brothers is building an aeroplane and is equipping it with the large diameter Pennsylvania aeroplane tires. The Pennsylvania Rubber Co. has supplied Clifford B. Harmon with rubber to renew the shock absorbers on his Farman, which is already equipped with Pennsylvania tires.

The Pennsylvania Rubber Co., whose works and main office are located at Jeannette, Pa., and who are now giving employment to nearly 1,000 people, have recently put on the market an aeroplane tire peculiarly suitable to the advanced stage of aeroplane development.

Heretofore motorcycle tires of 2½ in. and 3 in. section have been largely used on aeroplanes. Such tires are not designed or adapted to stand the shocks of alighting and have little cushioning effect. It is therefore often necessary to use four wheels on an aeroplane, resulting in a considerable increase in weight and air resistance.

The Pennsylvania aeroplane tire is 20 by 4 in. in size and is of light but strong construction. Two of these tires will carry a ten or twelve hundred pound flyer, and will have sufficient cushioning effect to prevent the jar of alighting being transmitted to its delicate framework.

This tire is similar to the Pennsylvania clincher automobile tire, but constructed with a view to its use on aeroplanes.

The 20 in. by 4 in. tire complete with tube weighs only seven pounds. For lighter machines they are turning out a 2½-in. tire in both 26-in. and 28-in. diameter of the same light and strong construction which may be employed where the use of a wheel of a larger diameter seems to be advisable.

Requa-Gibson Propeller Holds Record.

Clifford B. Harmon, who holds the United States amateur endurance record with his Farman, recently had the machine fitted with a Requa-Gibson regular type propeller, 8½ ft. diameter by 2-ft. pitch. Referring to its performance, Mr. Harmon writes: "With this propeller I broke the amateur record of America of 1 hour 5 minutes. It seems to be giving entire satisfaction."

With this propeller and the engine running at 1,200 r. p. m., the pitch speed figures 2,400 ft. per minute. Now, the aeroplane flies at 40 miles per hour, or 3,520 ft. per minute, which is considerably more than the pitch speed of the propeller. Patrick Y. Alexander experimented with model propellers on a wire on board the steamer traveling between England and America, and found that these advanced into the wind. The Requa-Gibson company promises some startling information in the near future, as the result of present investigations.

Club News

The **Lincoln Aero Club** is the name of a new body just organized for the purpose of discussing aerial navigation and promoting the sport in Lincoln, Neb. The six charter members are Dr. G. R. Brownfield, Joe Burnham, Commandant H. E. Yates of the University cadet battalion, G. W. Chowins, superintendent of grounds and buildings at the university; E. C. Babcock, and Dean Richards of the department of engineering at the university. As soon as possible club grounds are to be established somewhere on the outskirts of the city where the necessary sheds and other equipment will be erected, and test flights will be made.

Dr. Brownfield is working on a 4-ft. model for a double bi-plane on which he has applied for a patent. He is to have two pairs of planes, one pair directly ahead of the other. His machine, according to the model, he has constructed, is to have at least two advantages over the Curtiss and Wright machines. Both of these operate in preserving the equilibrium of the machine. One is a controller operated by the engine and the other is a pair of wings lying on a horizontal plane on either side of the machine. These are operated by means of a lever. If the machine should dip to the left, for example, the left wing being thrown out to offer resistance in the atmosphere, while the right wing is raised to relieve resistance.

Dr. Brownfield, of 1234 "O" St., is enthusiastic and has arranged for the club to visit the Omaha meet in a body.

McGill Aviation Club has been formed by students at McGill University, Montreal, Can.

The **Aero Club of Colorado** is requested to inform us of its address. A letter addressed to the club at 30 W. Colfax Ave., Denver, has been returned by the Post Office.

The **Aero Club of Philadelphia,** which has existed in name only for more than two years, has been dissolved. Some of its members have joined the Pennsylvania Aero Club.

It was also announced that Clarence P. Wynne, treasurer of the old club, had been elected secretary of the Pennsylvania Club, Henry S. Gratz, president of the old club, had been elected vice-president of the Pennsylvania club, and Arthur T. Atherholt, secretary of the old club, had been made president of the new club.

A **Boys' Aero Club** has been formed at the Omaha, Neb., Y. M. C. A. Sergeant C. F. Adams, of the signal corps at Ft. Omaha, gave the new club its first lecture.

The **Aero Club of California** held its election of officers on the 28th of June. The following officers were elected for the ensuing year: President, H. LaV. Twining; 1st Vice-President, R. I. Blakeslee; 2nd Vice-President, W. H. Leonard; Secretary, Buel H. Green; Treasurer, Chas. E. Rilliet; members of Board of Directors at large, W. S. Eaton and Van M. Griffith.

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Aeroplanes : Gliders : Propellers
Wheels : Turnbuckles : Sockets : Etc.

Laminated Ribs and Beams in Stock and to Order

AUGUST SPECIAL—5 ft. 6", 4 ply, laminated rib, aeroplane curve, **35c. each**

Agents—Whitehead Motors, Detroit Motors, Palmer & Goodyear Aero Tires, Bosch Magnetos "Aeronautics"

Get our prices on Knock Down Planes, including Beams, Struts, Ribs, Sockets and Rib Connections

CRAFTSMAN
Perfect Propellers

IMPROVED
Santos Dumont Type

AEROPLANES 17 and 20 ft. COMPLETED **$1,000**

Send for Specifications

All Kinds of Wood and Metal Work Made to Order. Gliders, Special Parts, Spars, Struts, Ribs, Skids, Wheels, Etc.

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The **South Bend (Ind.) Aero Club** has been formed with the following officers: President, Colonel Jasper E. Brady; vice-president, George Cutter; secretary, B. S. Walters; treasurer, Elmer R. Stoll.

The **Aeronautical Society** offered a prize for the most helpful essay. Seven members prepared papers and all were read on one of the regular meetings. The prize was awarded by popular vote to Laurence Lesh. On July 14th Charles H. Inman addressed the society on the subject, "Proving the Horsepower of Engines by Reaction Test." Mr. Inman's talk was most interesting. His device is intended to be capable of use on an aeroplane to show the aviator at all times just what horsepower his motor is delivering and what his propellers are doing. This paper will be printed in AERONAUTICS.

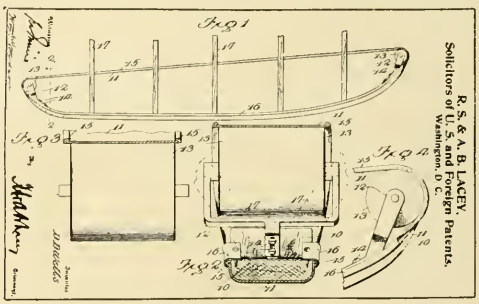
Exchange and :: :: Forum :: ::

STARTING DEVICE FOR SALE.

D. D. Wells, R. F. D. 2, Jacksonville, Fla., has recently taken out a patent covering a skid to assist starting on rough ground without employing any track.

In the sketch, Fig. 1 is a side view, Fig. 2 shows a transverse section of same, Fig. 3 is a detailed end view of one of the pulleys with the belt applied thereto and Fig. 4 is a detail side elevation of one extremity of the skid.

In operation the skid is positioned on the ground when the outer face of the belt (11) engages with the ground and the runner (10) is supported upon the upper lubricated face of the belt. When the skid is forced longitudinally, the runner is caused to slide over the belt and to cause the movement of the belt beneath the runner and over the pulleys (13). The guides (16) engage the beads (15)



throughout the length of the runner, and holds the belt in concaved position to engage about the polished surface of the runner. As the belt reaches the end of the runner at the rear extremity of the skid, the same is released from the guide (16) and permitted to engage over the flattened surface of the adjacent pulley. Mr. Wells desires to dispose of the patent at a reasonable figure, as he is financially unable to exploit it.

ATTRACTIONS WANTED.

E. F. Stephenson, 250 Vance Ave., Memphis, Tenn., wants to connect with aviators having successful machines and aeronauts with dirigible and free balloons.

CENTER OF PRESSURE.

Question: Please inform me how to find the center of pressure on a biplane whose surfaces measure 5 ft. fore and aft, with a curve of 1:20. The angle of inclination is 6 degrees when the aeroplane is on the ground. Must not the center of gravity be just a little below and back of the assumed c. of p. when the aeroplane is not in motion, considering that because in flight the

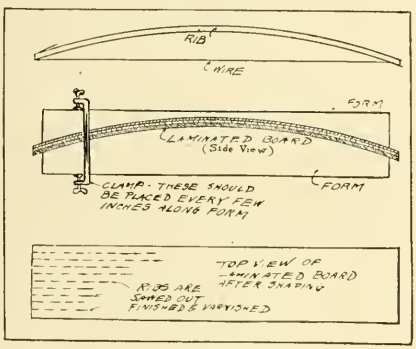
c. of p. moves forward, the center of gravity must be rather in front of the assumed c. of p.?

Answer: One can suggest no convenient way to find c. of p. of an aeroplane except by actual trial. The c. of p. of a small experimental plane having same depth of curvature would be for 6 degrees about 44 per cent from front edge, and if this held true for a large surface it would be 2 ft. 2 in. from front; that is, for a circular arc. For a parabolic curve it would probably be further forward. See discussion of Aerial Experiment Association in June, 1909, number, pp. 175-7. The weight, or center of gravity, should in general be forward of the c. of p. This point depends somewhat on the method of vertical control (the disposition of elevator and horizontal rudder). See also p. 153, April, 1910, AERONAUTICS, and article by M. B. Sellers, pp. 77-79, March, 1910.

HOW TO MAINTAIN CAMBER.

One method of maintaining the camber of ribs, though not generally used, is to use a thin span wire to join the tips, this wire forming the chord of the rib. Ribs are usually bent after steaming, dried and then made impervious to moisture by varnish. As long as they do not absorb moisture they will stay bent.

Laminated ribs can be glued and bent at once while the glue is wet, put thus in a form to dry and when dry taken out and varnished. These will hold their shape, even though they absorb some moisture, providing the glue does not soften.



How to Make Ribs

Another method of making ribs is as follows: Take thin boards of the desired thickness and wood and glue them together, one on top of another. While the glue is wet place the laminated board thus made into a press or form the shape of the ribs you want. Clamp the form tightly together and place the whole in a drying oven for several hours. When dry the ribs can be sawed out of this curved board. A correspondent says that if ribs are wet or soaked, then bent on a board and held by bent nails, then dried and burnt a little by a gasoline torch on the concave side, they will say bent.

THE WILLOUGHBY STEERING DEVICE.

Dear Sir:

I was invited by Mr. Harmon recently to witness a flight in his "Farman" machine, lately purchased from Paulhan, who used it at Los Angeles last winter. I was quite surprised to find that it steered in the vertical plane with my patent steering device (applied for on the 16th of June, 1909, several of the claims having already been allowed).

This patent consists in steering an aeronautical machine in the vertical and horizontal planes by a combination of rudders. All biplanes steer up and down by the head alone. All monoplanes steer up and down by the tail alone. In my device the "War Hawk" steers up and down by both head and tail at the same time.

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Mr. M. L. Kasmar, Author of the book **"First Lessons in Aeronautics"** with J. W. Curzon as instructor and Aviator-Demonstrator, opened beginning of July for actual practice in the art of flying and building at

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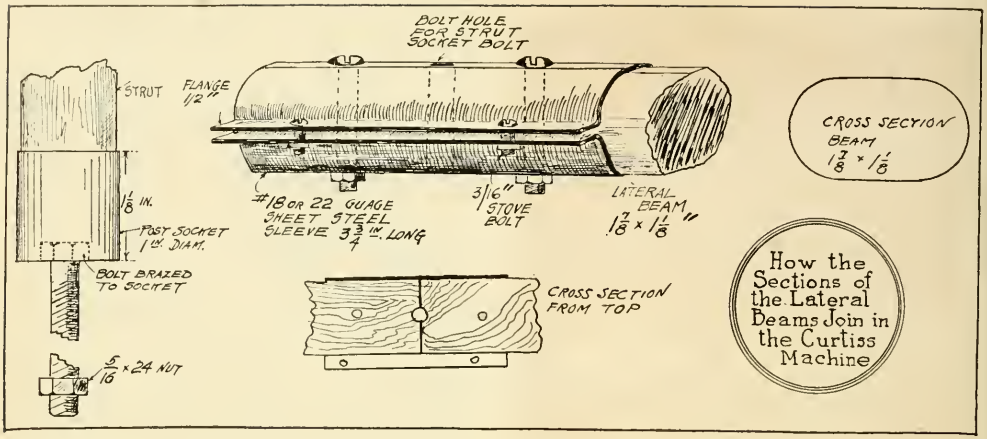
For particulars concerning school, apply
M. L. KASMAR, Sec'y., American Aeronautical Society
CHICAGO, ILL.



By crossing the tiller lines of the forward and after horizontal rudders, an inverse action of the rudders is obtained, elevating the bow and depressing the stern, halving the surface required for each rudder. The pressure on the upper side of one and on the under side of the other keeps the parallelogram of forces rigid until a slight directive force is given by the steering wheel.

Three years ago at Brighton Beach I described this patent to Mr. Farman and told him I was putting it on the "War Hawk," and I see he has now paid me the compliment of using it.

At the recent aeronautic convention in New York I was asked by several persons if it was my intention to sue on infringements. My answer was that I would not, and that I was more than pleased if I had added my little mite to the science of aviation. Yours truly,

HUGH L. WILLOUGHBY.

PADDLE WHEEL DEVICE.

Dear Sir:

Dr. Greene of Rochester, who is building an aeroplane, kindly refers me to you for address of parties interested in the idea of a folding slat paddle wheel, which device, he says, has been patented, for sustaining aerial machines. I think I have a method of appreciably increasing atmospherical resistance to downward movement of a paddle or wing and thereby increasing its lifting effect, and would like to get in communication with parties desiring to have such a device made more effective than it has so far proved to be.

JOHN R. GRAHAM,
24 Locust St.,
Rochester, N. Y.

SAFETY DEVICE FOR AEROPLANES.

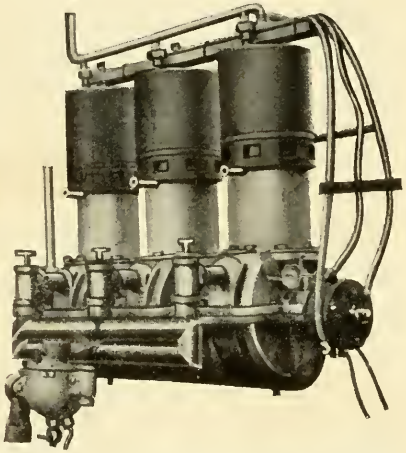
Gentlemen:

The undersigned begs leave to suggest the following as a possible improvement in safety devices for machines used in navigation of the air, but more particularly for heavier than air machines.

A combination in an aeroplane or air ship of a galvanometer, an electric battery or other device for generating and maintaining a constant electric current and devices adapted to connecting in electrical circuit with the galvanometer and battery or generating device the metallic wires, parts or members of the aeroplane or airship and their connections:

For the purpose of indicating, by means of the galvanometer, injuries or abrasions of said metallic wires, parts or members and their con-

LIGHT WEIGHT



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SAYS PHILADELPHIA II HAS BALLOON RECORD

Dr. Thomas E. Eldridge Replies to Conyers Graham in Controversy

ALTITUDE IN DISPUTE

The aeronautical controversy still continues. Dr. Thomas Edwin Eldridge sent the following letter to The North American yesterday, taking polite exception to some statements made by Conyers Graham in yesterday's issue:

"Apropos of the article in this morning's issue of your paper," he says, "I regret to say that Mr. Graham is again misinformed. Heretofore, Dr. T. C. Fulton, president of the Ben Franklin Aeronautical Association, has always claimed the record for altitude, distance and time in the air for the Ben Franklin. The Philadelphia Aeronautical Recreation Society, therefore, must continue to claim for its balloon Philadelphia II the amateur record for altitude and distance from Philadelphia, this being proven by the records.

"Incidentally, commenting upon Mr. Graham's statement, please let it be understood that the only balloon ever used in Philadelphia for advertising purposes is the Ben Franklin, inasmuch as on its first ascension there were distributed free beer checks, advertising a local brewery and the president of the association was with the party on this ascension. May I add further that the bylaws of the Philadelphia Aeronautical Recreation Society do not permit its air craft to be used for advertising purposes, nor do the rules of the society allow its passengers or guests to carry intoxicating liquors."

BY RIVAL BALLOONIST

Philadelphia II Has Amateur Long-Distance Record, Says T. E. Eldridge

QUESTIONS STATEMENT

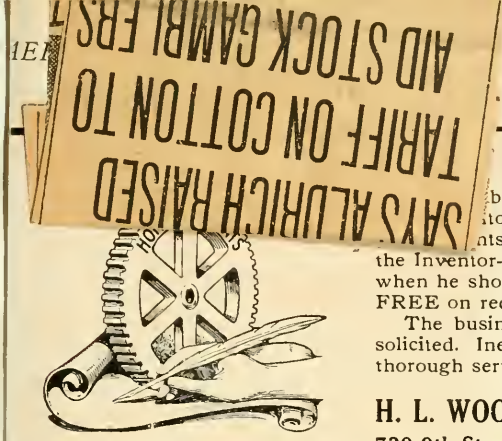
In the controversy over rival claims to records between the Philadelphia Aeronautical Recreation Society and the Ben Franklin Aeronautical Association, Thomas Edwin Eldridge, of the former organization, yesterday sent out a letter disputing a statement regarding a trip made by Conyers B. Graham, of the Ben Franklin association, in 1907. The letter says:

"The Philadelphia Aeronautical Recreation Society concedes to the Ben Franklin Aeronautical Association the record for time in the air claimed by Dr. T. C. Fulton for the balloon Ben Franklin on October 17, 1907, by twenty-five minutes.

"The Philadelphia Aeronautical Recreation Society, however, does not concede the record claimed by Conyers B. Graham for the balloon Ben Franklin on its trip to Dwight, Mass., and the statements made by Mr. Graham concerning this trip are not correct.

"The balloon Ben Franklin never sailed from Philadelphia to Massachusetts, but did sail from Aura, N. J., to Dwight, Mass., in 1907. This ascension was made on Saturday afternoon about 2.30 and landed at Aura, N. J., about 5.20. On this short trip were Prof. Samuel A. King, a professional pilot, with Dr. George H. Simmerman (then vice president of the Ben Franklin Aeronautical Association), Edward G. Rech (then its secretary), Henry Gratz, Mr. Longacre, George Mayer and Dr. Thomas Edwin Eldridge. From Aura, N. J., the following day, at 1.05 A. M., the Ben Franklin started again and from this point landed in Dwight, Mass., about 9.20 A. M., Professor King being the pilot, while the gentlemen in the basket were Dr. George H. Simmerman, Messrs. Rech and Mayer and Dr. Thomas Edwin Eldridge. Neither Mr. Gratz nor Mr. Longacre were in the basket when it sailed to Dwight, Mass., as claimed by Mr. Graham, and as the records of the Ben Franklin Aeronautical Association will corroborate.

"The amateur balloon record for altitude, 17,050 feet, made by Dr. Thomas Edwin Eldridge, Dr. George H. Simmerman and Welsh Strawbridge, on June 10, 1910, and the distance record of 250 miles, air line, made last week from Philadelphia to Pascoag, R. I., by Dr. Thomas Edwin Eldridge, William S. Underhill and Arthur S. Underhill, are unquestionably held by the balloon Phila-



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ctions, such as would reduce their cross section materially reduce their strength and safety ctor.

The purpose of drawing this claim and publishg it is to prevent it from subsequently being tented, and to give all interested free use the suggestion, if perchance it should be found contain any elements of value.

ALBERT W. BUEL,
15 William St., New York.

Ascensions

PHILADELPHIA, June 16.—Dr. Thomas E. ldredge, Dr. Geo. H. Simmerman and Welsh trawbridge, in the "Phila. II," attained an altiude of 17,050 feet. The landing was near Petersille, Pa., after 2¼ hours; a distance of 60 iles. Dur. 2 hrs. 35 min. It took but 18 min. drop 17,000 ft. A new high ascent will be atmpted, properly equipped with plenty of ballast nd supplies. The highest American official record 16,615. A. H. Forbes went up to 20,600 feet, as ecorded last month. There are 28 ascensions on ecord higher than the Harmon-Post ascent of 6,615, not including Forbes or Eldredge.

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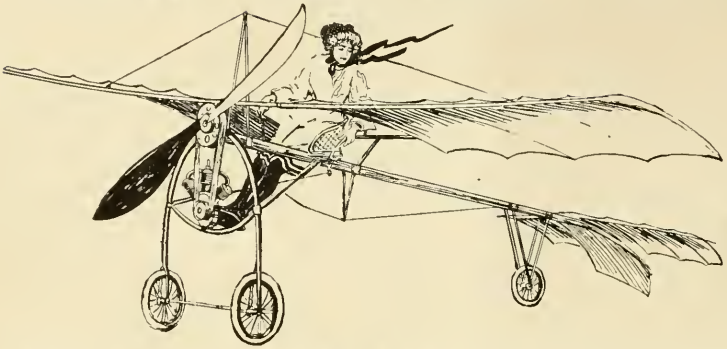

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ST. LOUIS, June 18.—At 5.30 p. m. H. E. Honeywell and W. F. Assmann, left in the "Centennial" to make another attempt to win the Lahm cup. The landing was made 6 miles south of Bowen, Ky., on June 19, at 6.30 p. m. Just after landing a heavy storm broke. The distance is 354 miles.

CANTON, June 18.—J. H. Wade, A. H. Morgan and W. K. Chisholm in the "Sky Pilot" to Fairview, Pa.

ST. LOUIS, June 20.—Miss Julia Hoerner decided to become a pilot. After half an hour an electrical storm came up and the aide, John Berry, helped her make the descent, 9 miles from St. Louis. The balloon was the "Melba."

PITTSFIELD, June 25.—Wm. Van Sleet, Wm. M. Dear and F. M. Christie.

LOWELL, June 25.—Charles J. Glidden, Mrs. M. N. Glidden and J. J. Van Valkenburgh in the "Mass." to Salem, N. H. Dur. 1 hr. 35 m.; dist. 12 m.; alt. 4,100 ft.

ST. LOUIS, July 2.—Wm. F. Assmann, qualified as pilot, taking up two passengers. Landing was near Pattonville, Mo. Dur. 2 hrs.; alt. 6,200 ft.; rained during part of ascent.

PHILA., July 9.—Dr. Thomas E. Eldredge, Dr. George H. Simmerman, Dr. L. F. Fiffer and Miss Anna Nittinger, in the "Phila. II," to Mount Holly, N. J. Altitude reached 7,900 ft.

LOWELL, July 9.—Chas. J. Glidden, John J. Van Valkenburgh and Edward E. Strout in the "Mass." to Andover, Mass. Up 40 min.; dist. 4 miles; alt., 2,100 ft.; poor gas. This made Mr. Glidden's 47th ascent.

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Patent List.

Robert E. Green, New York, N. Y., 960,539, June 7, 1910, filed June 22, 1909. AIRSHIP. An aeroplane consisting of a plurality of sails at the front and another set at the rear with a propeller intermediately between them. Both sets of sails are pivoted so as to be movable and in addition the rear set is provided with rudders movable laterally.

Louis L. Crane, New York, N. Y., 960,831, June 7, 1910, filed Dec. 21, 1909. FLYING MACHINE. A toy aeroplane the characteristic features of which are a frame composed of several rods secured to a plate at the front and joined at the rear in the form of a tripod, in the center of which extends a rubber band operating a propeller at the front and a triangular tail piece at the rear.

Frederick W. Wuerth, Cincinnati, O., 961,925, June 21, 1910, filed March 15, 1910. ATTACHMENT FOR AEROPLANES, consisting of flexible wings attachable thereto and projecting outwardly therefrom. Means are provided for distending or collapsing the wings and changing the angle of incidence.

George D. S. Reece, St. Louis, Mo., 962,386, June 21, 1910, filed June 10, 1908. AIRSHIP, the characteristic feature of which consists of sets of wings, each wing comprising a frame made up of a rod projecting at right angles from a shaft, and a series of arms projecting from the rod. This frame is covered with cloth and several such wings extend radially from the shaft in the same plane.

Samuel Montgomery, Stockton, Cal., 962,652, June 28, 1910, filed Dec. 14, 1908. FLYING MACHINE of the helicopter class, comprising a main rotative shaft used vertically from the cage or basket containing the motor. This shaft is provided with propellers and at its top a parachute is secured, so arranged that connections from the cage enable the opening or closing of the parachute.

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(*Continued from page 60*)

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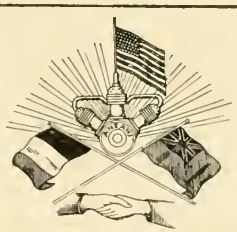

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WE are forced to print all new material this month in small type in order to make room. There is on hand considerable amount of material in type for which we have been unable to find space as yet.

Hour flights abroad are so common that it seems useless to further chronicle them, and in the future we will merely try to print new records made, new machines, especially long flights and events of more than usual importance.

PROGRESS will certainly demand its toll of lives, but there is certainly no cause for alarm. Fatalities have not been as numerous as those which occur in nearly every automobile meet of importance, and the entry list in the aviation meets has been fully as large as that of any motor race. Considering the number of flights made, both at meets and elsewhere, the restricted grounds at which many meets are held, one may feel assured that the percentage of fatalities is small.

A word of caution is necessary, however. Development does not appear to be along the line of making safer machines, but in building faster and more varied types. Familiarity breeds contempt, and aviators should not take the fearful chances that some do.

IT is worthy of comment that aviation abroad has reached the stage where meetings may be held on the same basis as motor and horse racing, where competitors pay entrance fees returnable only on condition, say, three laps of the course are made, and where the sole remuneration consists in the prizes to be won.

Correction.

In the article, "How to Make a Propeller," in the July number, the last two paragraphs, by mistake, were misplaced and put in the adjoining column. The last sentence of the article should read: "This will NOT duplicate, however, a Curtiss propeller, etc." The word "not" was omitted.

Permanent :-: :-: Exposition

THE Permanent Exposition at the office of AERONAUTICS is growing. People are coming in every day to look over the various exhibits and immediate calls on the manufacturers result.

We want to have every manufacturer of aeronautical material represented. If necessary, use the Exposition as a stock room, as some are doing. We want motors, samples of sockets, oils, bearings, magnetos, plugs, tires and anything that may be applicable to the new industry.

Manufacturers should send a supply of their catalogues and print on their circulars, stationery and letters the fact that they are exhibitors in AERONAUTICS' PERMANENT EXPOSITION.

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PROFAC FOOD.

What Bishop Says.

"'Will the Wrights compete for the International Cup?'

"'No one knows as yet; they refused last year to compete and it is I, Cortland Bishop, who paid the expenses of Curtiss so that one American aviator might compete for the cup and he won.' He adds with a practical and national instinct; 'it cost me a great deal of money.'

"'It has been said that the International Cup would cost aviators very dearly in expenses, etc., and would only result in the winning of an art object of medium value.'

"'No doubt, but French aviators are free to come or not as they please.'

"'Then your opinion is that apparatus of French origin will win over the American's?'

"'I have not ridden with the Wrights but only with Paulhan. The impression of security is perfect and must be much greater than with the Wrights. These oscillate a great deal in the air and I believe in the superiority of the French.'

"Mr. Cortland Bishop stopped and offered amiably to complete the interview when desired. We shook hands cordially and transatlantically and he renewed his walk towards the Tuileries."

The above statement of Bishop with respect to Curtiss is not an accurate statement of the facts.

The above interesting item was printed in the French organ *l'Aero*, being an interview with the honored president of the Aero Club of America.

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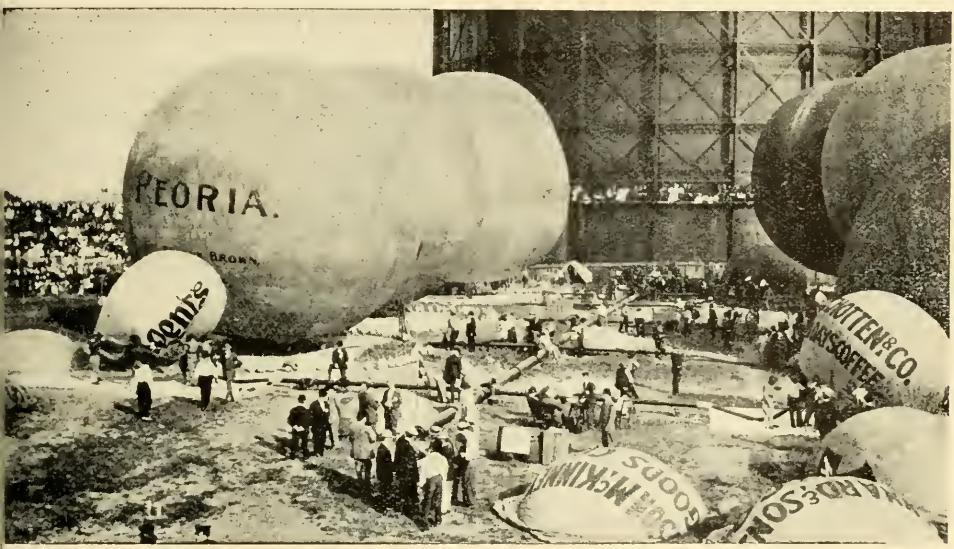
Balloon "St. Louis III"— speed record of America — Lambert, pilot; Von Phul, aide
JUST THINK OF IT, EVERY CONTEST IN THE LAST TWO YEARS.



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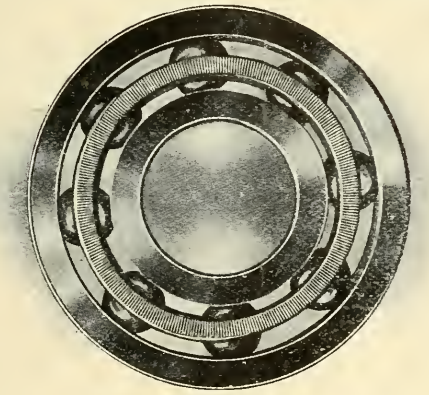

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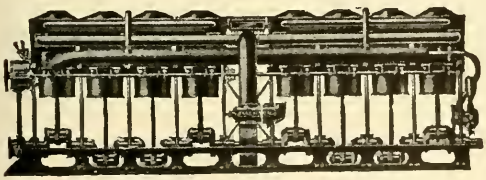

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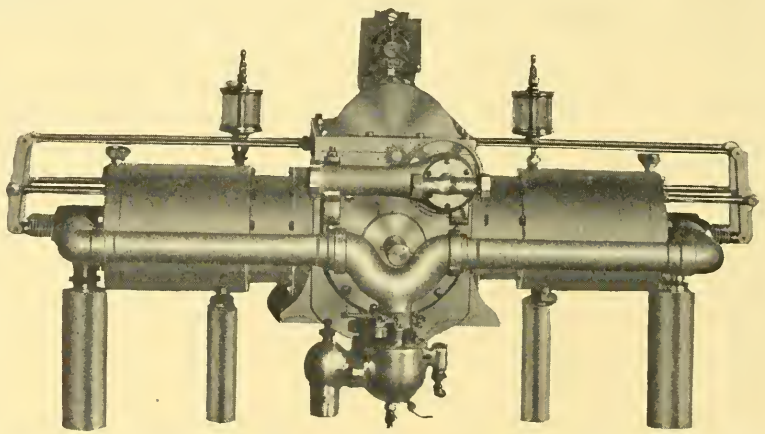

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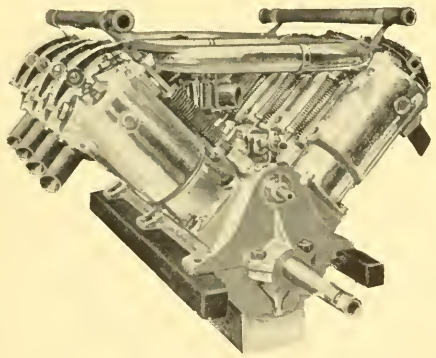

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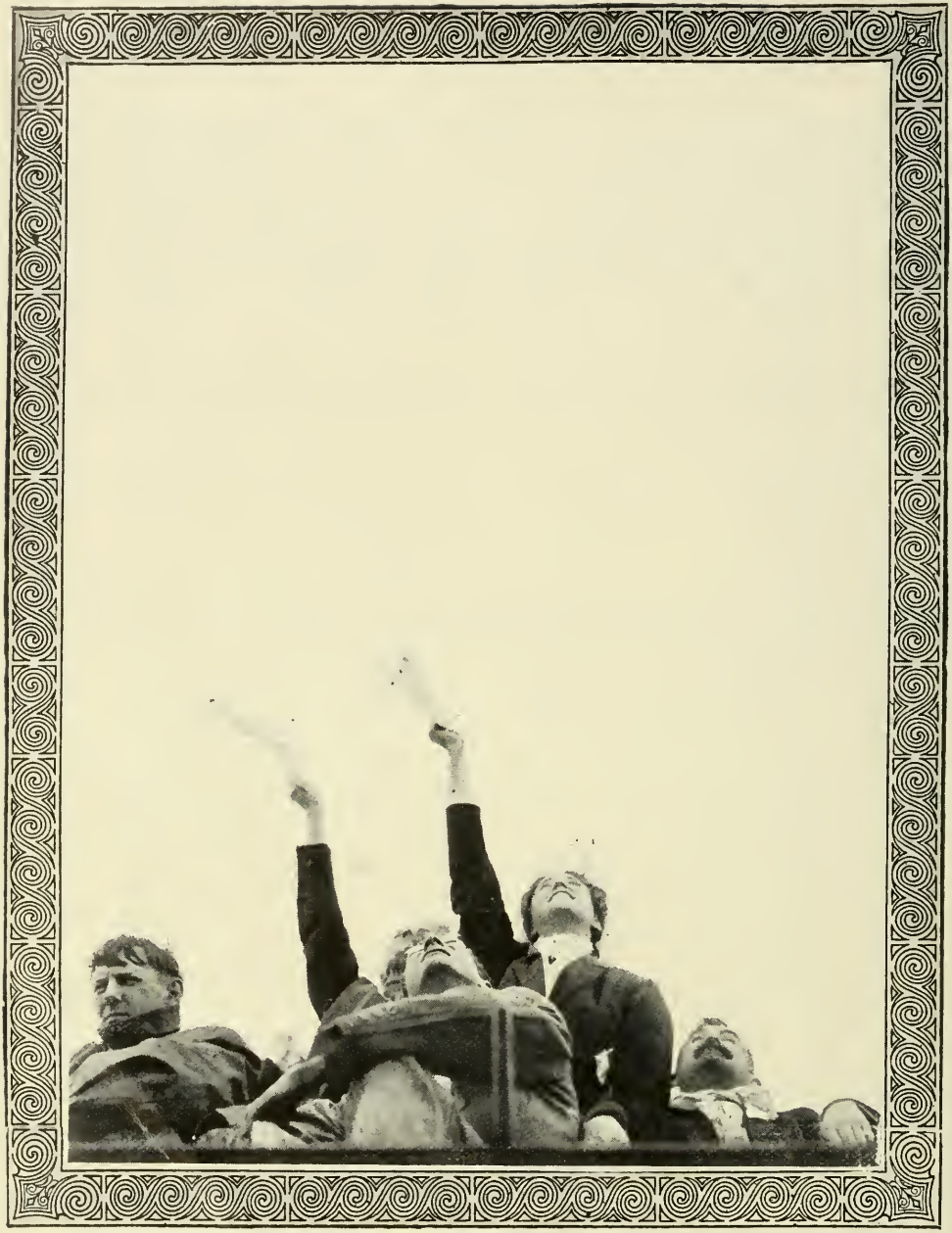

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Vol. VII.

Aeronautics

No. 3

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ROVING HORSEPOWER—BY REACTION

DELIVERED BEFORE THE AERONAUTICAL SOCIETY

By C. H. Inman.

OTE:—The author of this paper has devised apparatus for indicating the r. p. m. of an ne and the propeller thrust at all times dur- flight. The paper contains much food for ght.—THE EDITOR.

OR a number of years I have noted the need of some reliable method of determining the horse power of small internal combustion and other portable engines, and ite the possible value of some device which i be attached to aeronautic and other similar ines to show at all times the horse power loped by the engine while in actual service. steam engineer can tell by a glance at his n gauge whether his pressure is high or low knows at once if he is supplying his engine the maximum pressure. The gas engineer not this aid, but must trust blindly to obtain- he right combinations of numerous conditions then guess at the result. * * * * *

ere are various methods by which this may one, of which I mention three, besides the I will describe later; and of which last- ioned method I believe I am the origin- * * * * *

ould my method prove of value, I will exact condition that the same be called as I have tened it, "The Reaction Test," to deter- the horsepower of engines and other ma- es where applicable; and further, that the e be accredited to me unless someone else rove a better and prior claim.

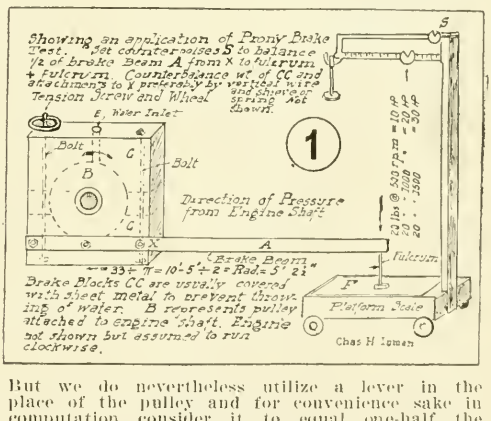
e first of the three methods mentioned, I state, is the well-known "Prony brake test," you will later note that I seem to follow a way, but a close analysis will show a ed departure in some respects.

e second method in merit I will accord to dynamometer," also well known among engi- . One application of which is to attach a or blades to the shaft of the engine, said s being of a known area and set at a in distance from the shaft centers, at a speed exert a certain amount of resistance, ding to area, diameter, speed and atmospheric ty. From these we may calculate constants used in conjunction with speed of engine.

e next method is an electric one or the n resistance of electric currents flowing gh proper conductors, or magnetic effects. ese three methods are all of merit in certain s, but none of them can be utilized, as far e writer knows, while the engine is develop- useful work, possibly excepting some of the ic devices. I will endeavor to show how a device may be applied to aeronautical and engines showing at all times the exact r exerted by the engine without absorbing of the energy developed by the engine while ctual service. Said device, I think, need weigh more than 10 pounds for a 50 horse- r engine, and may be applied equally well to olving cylinder type or the ordinary crank type. With the aid of another attachment ght weight the exact pull or thrust of pro- may be measured at the same time in a r manner. This may be useful to aid in mining the variations due to changes in at- heric condition and also in different alti- , as well as showing at once the best mean ge speed, power absorbed and pull of propeller varying conditions, absolutely doing away guesswork. With the aid of a suitable speed indicator and a graduated strip or ribband of paper passing over a small, light drum driven by suitable means from engine shaft, it will be possible to obtain an accurate record under varying atmospheric conditions.

Now in describing my method I will follow for a way the "Prony brake" system, the same rules for calculating being used; but the method of procedure being diametrically opposite, there being no braking effect in my method and positively no absorption of power as in the other methods. I measure the power from the end of a lever practically in the same manner as may be done on the Prony system, but on the opposite side and contrary-wise direction or in reverse direction of transmitted power.

Assuming a horse power to equal 33,000 pounds raised one foot high per minute, a pulley 33 ft. in circumference rotating 1,000 r. p. m. would, with a resistance of one pound at the periphery, be exerting one horse power; with a 10-pound resistance, 10 horse power; 50 pounds resistance our load equals 50 horse power. If the pulley is rotating 500 r. p. m. then our indicated horse-power equals one-half of the above stated amounts. If speed of pulley should be 2,000 r. p. m. then our reading would be doubled or 2, 20 and 100 horse power, respectively. This pulley, like the North Pole, does not exist, so all persons are warned not to fit out any expeditions to search for it, but is used only as an illustrative point.



But we do nevertheless utilize a lever in the place of the pulley and for convenience sake in computation consider it to equal one-half the diameter of the pulley, although it may be in practice preferably shorter and also on that account compounded to reduce weight and pressure on the same principle as the platform scale, or a lever of the second order, therefore, 33 ft. circumference ÷ 3.1416 (pi) ÷ 2 = 5 ft. 2½ in., radius of wheel or the length of our lever and the same pressure exerted at the free end of this lever will register the same results on the platform scal or calibrated spring as the weight or resistance on the pulley of same radius with corresponding speeds.

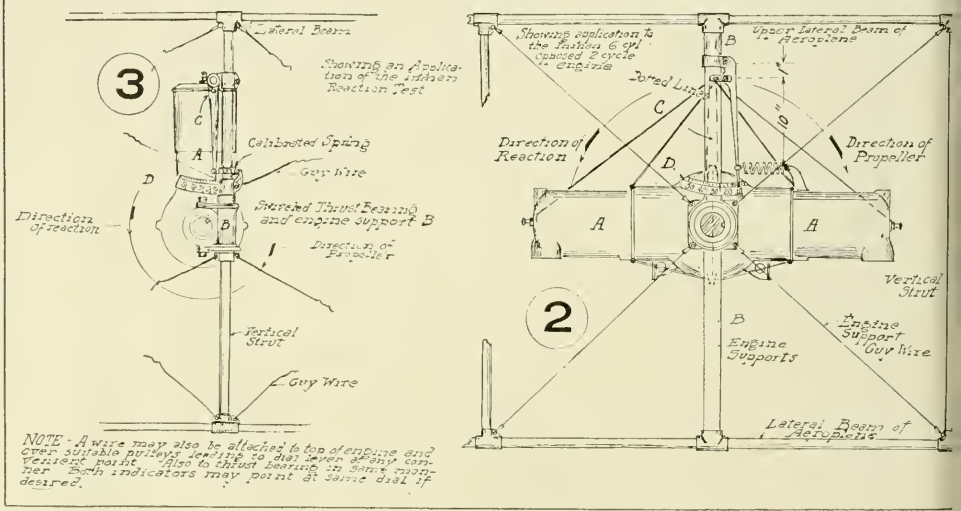
Now Diagram No. 1 will show the application of the Prony brake principle. Let A be the lever, B the pulley attached fast to engine shaft, the exact diameter of pulley is not essential, but

the length of lever is; C the brake blocks, D the means to tighten the pressure on pulley, E the flow of water to prevent the ignition of wooden blocks and overheating of pulleys by friction, F the platform scale on which the thrust of lever is weighed. This thrust is in the same direction as the engine shaft and engine must be bolted down or otherwise well secured to prevent overturning. A speed indicator being used in conjunction with the apparatus as in the dynamometer method and a constant to assist in the computations.

Now as the method is generally well understood and may be readily observed from the diagram, it may not be necessary for me to go into further details of the Prony brake principle, therefore in Diagram No. 2 I will illustrate my method of "Reaction Test."

Let A represent the engine, B the support for engine which may include a ballbearing and slipped on engine shaft, but preferably a short, projecting part of hub supporting engine shaft bearing. At each end of crank case and concentric with shaft, permitting a free movement of the entire engine and crank case independent of crank shaft movement, through a small arc of possibly 5 deg. will be sufficient.

Connections to engine, such as water circulation and supply pipe must be made flexible, of course, to permit free movement of entire engine through the small arc needed. Should engine



be of a design which is top heavy; that is, the center of gravity very much above the crank shaft, then we would probably have to counterbalance by attaching underneath the engine crank case, radiator or some other part of the equipment: or it is permissible to make our engine supports large enough and eccentric to shaft to obtain center of gravity; in which event a flexible or universal joint would have to be provided for propeller shaft. This overbalance might not effect reading but a very small per cent while on an even keel, but doubtless would if a violent rocking motion were given to plane or wherever the appliance were used, but as it is intended solely for aeronautical work, we will not further consider outside effects.

In the type of engine which I am now developing and have patents pending, the cylinders are diametrically opposed in pairs and the center of gravity lies nearly on the crank shaft, therefore they normally assume a horizontal position. Let C represent our lever which we will compound on to the indicator hand to reduce weight and power of calibrated spring required, C being bolted fast to crank case moves through the same arc of vibration. D represents registering dial on which are indicated the pressure of the lever in pounds, corresponding to the 10-ft. pulley first mentioned. It may be noted here that the thrust of crank case lever C is in the opposite direction of crank shaft, contrary to the other metho above mentioned; my theory being that the fo exerted on the crank shaft is also equall by an opposed force from the crank case those types where crank shaft revolves and t reverse order in the revolving cylinder ty In the latter case we would merely attach. lever to one end of the crank shaft and in t event allow free movement as before stated. only remains now to attach another small le and dial to the thrust bearing of propeller determine the pull of same and a small sp indicator attached to engine to complete equipment. The power dial will now show torque exerted, the speed indicator the r. p. of engine and the propeller dial the pull pounds. If we do not wish to add extra mech ism to compute our indicated horse power may do it easily mentally. For instance, sp indicator shows 500 r. p. m., power dial 40 poun we are securing 20 horse power. The propel dial speaks for itself and if propeller is prope designed should show a pull of not less than pounds per horse power developed, or in t instance 180 pounds.

Should our speed dial register 1,000 r. p. then our reading with the same pressure power dial would be 40 horse power and propeller should show 360 pounds pull. Unfavorable atmospheric conditions and engine tails. Should there be a variation due to a tude or change of atmospheric condition, the po dial will indicate by the pointer if the en does not keep up the pressure, whether due lack of fuel, or air, or other cause, as any ex friction due to sticking pistons or hot journ will not be registered, including also impro fuel mixtures, etc. Should the atmosphere very light and thin, then the speed dial n show the engine is turning over all right, with a corresponding reduced torque and a fall off or normal maximum pull of the propeller indicated speed, thus we may be enabled to at a glance what is wrong. A wind anomome may assist in securing positive data on wh to obtain more accurate calculation as to ca and effect of various altitudes and changes of mosphere in the operation of aeroplanes and ot kindred subjects.

By utilizing the three indicators as previou mentioned, we may further make note of ot phenomena which will be of value to the avia and scientist alike. We can measure in act service the variations in propeller thrust due increased or decreased speed of plane, also to variations of engine before inertia of mach has been overcome. Also to variations due ascending and descending from elevations. effect when striking a gust or eddy of air. effect can also be observed independently engine, plane and propeller of the result o

(Continued opp. page 88)

The Bowden Patent Wire Mechanism

FOR *the* TRANSMISSION *of* RECIPROCATING MOTION THROUGH A FLEXIBLE AND TORTUOUS ROUTE

THE Bowden Wire Mechanism is particularly adapted for Motor Car, Motor Cycle, Motor Boat and Airship Service as follows: For

Brakes for Cycles, Motor Cycles.
Brakes for Motor Cars, Light or Heavy.
Valve Lifters for Motor Cycles.
Ignition and Throttle Controls for Motor Cars, Motor Cycles, Motor Boats and Airships.
Carburetor Ticklers.
Drags for Motor Cars.
Muffler Cut-Outs for Motor Cars, Motor Cycles, Motor Boats and Airships.
Auxiliary Air Controls for Motor Cars, Etc.
Clarclipse Gas Lamp Shades.

What it is.—The Bowden Wire Mechanism consists of but two parts—a closely coiled and practically incompressible spiral wire, constituting what is termed "the outer member," and a wire cable, practically inextensible threaded through the above and termed "the inner member."

What it does.—Previous to the introduction of the Bowden Mechanism the usual mechanical method of transmitting power in other than a straight line was by means of angle levers and rods, cables and pulleys, and other such devices, all of which necessarily involve considerable complication, besides increased labor and expense in adapting them satisfactorily to the user's requirements. The Bowden Wire Mechanism dispenses with all these difficulties, while enabling power to be transmitted by the most tortuous route. The mechanism is complete in itself, and requires only that one member shall be anchored to a stop at each end, and that the other member shall be attached to an operating lever at one end and to the object to be moved at the other.

The opportunities for the use of the Bowden Wire Mechanism are practically unlimited, and in every case its employment is accompanied by decreased cost of actuating mechanism, simplicity, instantaneous operation of actuated parts (due to absolute lack of lost motion) and reliability. The Bowden Wire Mechanism may be adapted to impart either a pulling or a pushing movement.

Over Two Million Feet Sold Annually

S. BRETZ COMPANY
SOLE IMPORTERS
Times Building :: New York

The Wright Company
Dayton, Ohio

Sole Makers and Exhibitors of the Famous

WRIGHT FLYERS

¶ Both 'planes and motors built entirely in our own factory

THE WRIGHT COMPANY

TO avoid type description in connection with "Construction Aids" has been the aim all along, making the sketches themselves fully explanatory.

Fig. 6 illustrates an interesting article by Marc Paird in our English contemporary *Aeronautics*. He says:

"The carrying surfaces of a monoplane enter into two classifications: the rigid and the flexible. The former type, which forms the rational solution of a light framework, is so expensive and so fragile that it has not been generally adopted. The latter type, on the other hand, has now been made to acquire a sufficient degree of rigidity.

"Instead of merely nailing down the cross ribs at their intersection with the main and secondary transverse spars of the wing, the joint at these points is now stiffened by various bindings, small blocks of cork glued in the corners, and other similar devices. Small square strips of Irish linen, even, glued in every corner have proved to strengthen the Bleriot type of wing to a material degree. The saw-cuts made in the distance pieces of the ribs, by the use of a band-saw (instead of a fret-saw) have to be closed by some process of this kind. (A)

"The general arrangement of the framework of a large wing, measuring some 20 ft. span from root to tip, is shown in (B). Strips of wood, preferably spruce, 1 in. wide, are used for the cross ribs. These taper down at either end, since the greatest strain nearly always falls about the center of their length (C). The distance pieces are carved out of willow ¼ in. thick (D). They are fixed to the ribs by means of linen tape bound three or four times round and glued down.

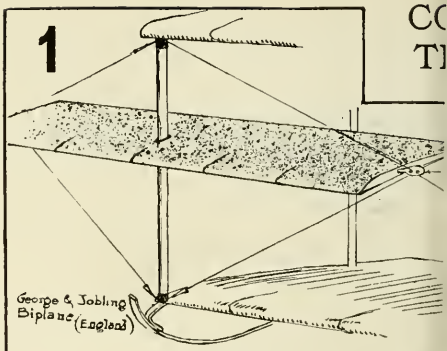
"The built-up transverse beams are made of two ash boards, ½ in. thick and 2 in. wide. A small number of distance pieces are sufficient to keep the boards together, since the ribs are placed only 1 ft. apart. In fact, three distance pieces for each beams are ample; two are utilized for fastening the steel bands to the wings, as shown in (E), and one to strengthen the root.

"The construction of the fuselage of a monoplane has given rise to innumerable experiments, designed to produce a structure combining extreme lightness with very great strength. As a matter of fact, one may state without exaggeration that those structures that present the appearance of greatest finish and neatest workmanship are generally the heaviest and most liable to break. Heavy, if aluminum sockets are employed; breakable, if any holes are bored in the beams. These members of the fuselage should never be pierced or weakened. They require a tight binding on their whole length, or at least in the vicinity of the struts. In this connection I may mention a useful tip, which is illustrated in F and G, and which has been found very successful in practice."

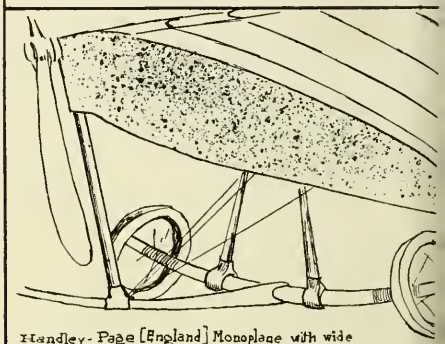
A valuable feature has been added to the aeronautic department of the Philadelphia *Inquirer's* Sunday issue, consisting of a weekly article by an expert, who writes under the name of Birdman. These articles are written in a bright, conversational style, and are replete with interesting facts and gossipy discussion of timely aeronautic matters. The *Inquirer* inaugurated a regular aeronautic department more than two years ago, at a time when many other newspapers were printing facetious articles about "present-day Darius Greens," belittling the efforts of aviators whom they now laud to the skies. The chief characteristic of this paper's aeronautic department is its sane editing. It wastes no space on fanciful schemes with absurd illustrations, but is a leader in the publication of real news and authoritative articles on aeronautic subjects.

The returns from the Louisville "meet" on June 18-19 are of interest to show the results under proper management.

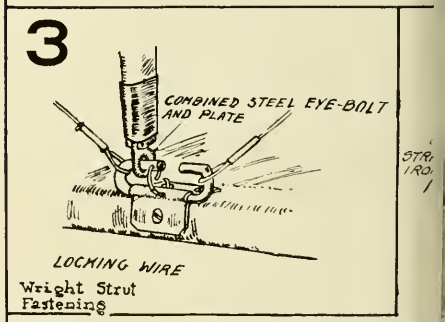
The sum total taken in was $33,636 in two days. The affair cost about $11,000, leaving a profit of $22,636. Had Curtiss been able to fly an hour earlier on one of the days, it would have meant a considerable increase.



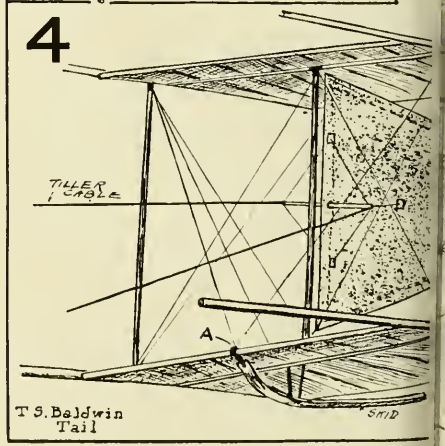
AILERON PIVOTED ON STRUT



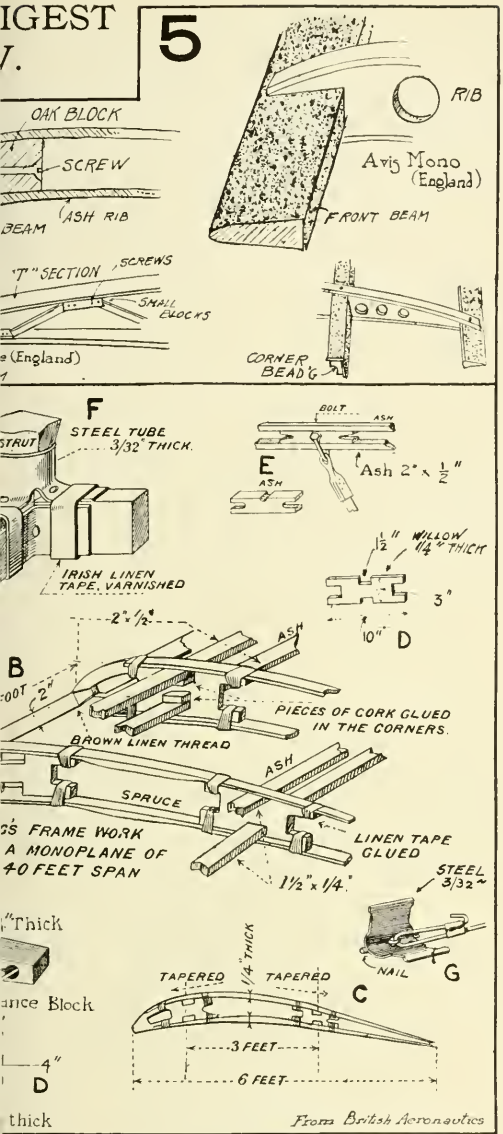
Handley-Page [England] Monoplane with wide hub wheels and a springy axle of wood



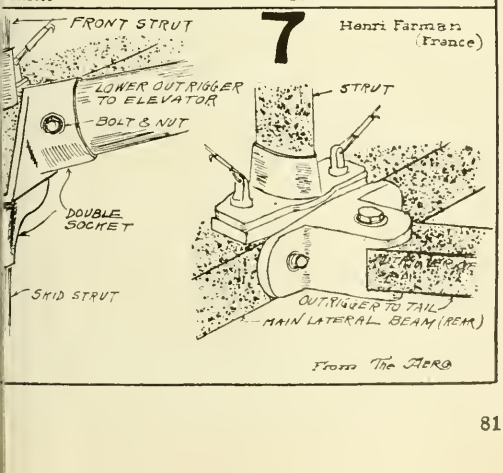
Wright Strut Fastening



T S. Baldwin Tail



From British Aeronautics



From The Aero

J. Prentice, Captain, U. S. A., stationed at Fort Hancock, N. J., has been working for a considerable period on the structure and curvature of the gull's wing, building many models and a large 30-ft. surface, made to scale to duplicate a gull's wing. It is Captain Prentice's theory that a surface after this pattern will prove much more efficient than the usual type of plane, and will enable flight at speeds down to 10 miles an hour. He has had exceptional opportunity for studying these birds, and he has observed them in free flight in smoke to obtain data on the action of the air currents leaving the wing.

William Evans, 817-A East Fifteenth St., Kansas City, Mo., has bought a Greene biplane equipped with a four-cylinder Elbridge engine. He will give exhibitions with it.

Charles K. Hamilton's new biplane, of the Curtiss type, is progressing. Walter Christie has the 8-cycle "V" 100 h. p. engine well in hand. This is intended to weigh less than 200 pounds. The piston rods are of tubular steel, the wrist pins, connecting rods and heads being bored wherever possible to reduce weight. The controversy between Hamilton and Glenn H. Curtiss is still in flight.

Lewis Strang, the famous driver of automobiles, has bought the imitation Curtiss biplane built by Fred Shneider for G. E. De Long, of the Elbridge Engine Co. This is fitted with an Elbridge 4-40-60 2-cycle motor, Bosch magneto, Schebler carburetor.

The public interest in aeronautics has been turned to good account by L. E. Dare of 216 West 104th St., New York, who recently returned from a tour of the country, showing principally in large department stores. He gathered together large-size working models of all the well-known flyers, with pictures, etc., to decorate the exhibit. A lecturer demonstrated the models at certain hours every day and explained to all inquirers the business of every part of the machines. The stores featured the exhibition, which covered about 400 sq. ft., in their advertising, and great crowds were daily visitors. In some cities the public schools attended in classes.

Ward and Brodie are trying out the Prof. J. J. Montgomery monoplane in Chicago and are making daily flights in James E. Plew's Curtiss machine.

Comparing the Gnome and the Adams revolving motors, Eric Walford gives credit for the early conception and practical work of the Adams-Farwell construction and finds them similar in principle. While the greater lightness belongs to the Gnome, the Adams has important constructive advantages. The power of the engine is controlled by varying the compression. A lever permits the adjustment of the inlet cam with relation to the revolving engine. For full power the cam operates as usual, but otherwise the inlet valve remains open during part of the compression stroke, so that part of the gas is blown back in the inlet pipe and less is compressed. This has the advantage that, when the engine is throttled down considerably, the pressure within the cylinders does not fall very low on the suction strokes, as in ordinary engines, and the lubricating oil will not be liable to be drawn past the piston rings into the combustion chamber. By this provision one of the great difficulties of revolving motors seems to be obviated in the Adams type. It has no exhaust pipe or muffler, but auxiliary exhaust ports at the bottom of the stroke break up the exhaust into two portions and reduce the noise. The gas is not fed into the crank chamber, as in the Gnome, but into an induction chamber, and thence through five radial inlet pipes to the tops of the cylinders, so that this engine does not resemble the radial-flow turbine as much as the Gnome, in which the gas travels radially outward through valves in the piston head, and then expands inward, passing outward through the cylinder heads again on the exhaust stroke.—*The Autocar*, June 4.

Glenn Curtiss Flies from Albany to New York City

In a Bi-plane Equipped with

PALMER AEROPLANE TIRES

Hammondsport, N. Y., June 4, 1910

THE B. F. GOODRICH COMPANY
Akron, Ohio

GENTLEMEN:—I have your letter of June 1st and thank you for your complimentary expressions.

The Palmer Tires, with which I equip all of my aeroplanes give the best of satisfaction for the purpose. The light weight *does not greatly impede the lifting power*‡ of the machine and the great resiliency enables me to *land without shock on the hardest ground*† and to *pick up speed quickly in starting**. I am glad to credit a part of the success of my aeroplane to the Palmer tire.

Yours very truly, (Signed) G. H. CURTISS.

* "Curtiss jerked a lever. The machine glided along the ground for perhaps fifty yards, and then rose steadily, gracefully in the air."—*The Outlook*, June 25.

† "Calm and cool, as unruffled as if stepping out of a street car, Curtiss, as he landed, called out, 'where's that oil and gasoline?'"—*The Outlook*, June 25.

‡ "There was a sudden whir of the engine, a dash across the field, and then like a huge bird Curtiss, in his aeroplane, rose gracefully in the air, circling about so as to come within the limits of Albany."—*The Outlook*, June 25.

The Palmer Aeroplane Tire

Manufactured by

The B. F. Goodrich Company - - - - Akron, Ohio

EQUIP YOUR AEROPLANE

WITH

GOODYEAR AKRON OHIO.

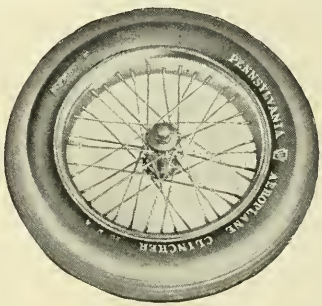
Aeroplane Fabrics
Aeroplane Tires
Bumpers

Tell us what you need, and let us explain the superiorities of GOODYEAR Materials.

THE GOODYEAR TIRE & RUBBER COMPANY

Akron, Ohio

AEROPLANE TIRES



Clincher type only, which is the lightest and most satisfactory type for aeroplanes

SIZE	Weight complete
20x4 in.	6¼ lbs.
26x2½ "	6½ "
28x2½ "	7½ "
28x3 "	8 "
28x3½ "	8¾ "

Wheels also furnished for the above sizes

Pennsylvania Rubber Co., Jeannette, Pa.

BRANCHES:
New York—1741 Broadway; Boston—167 Oliver Street; Chicago—1241 Michigan Avenue; San Francisco—512 Mission Street: Los Angeles—930 So. Main Street.

AEROPLANES AND BALLOONS IN MEXICO

By E. L. Ramsey.

The Buen Tono Bleriot Monoplane Totally Wrecked.

THERE was great enthusiasm displayed on the 24th of July to attend the trials of the Bleriot monoplane, made by Sr. Manuel Lebrija, the Mexican aviator, on the lands of the Rancho de Valbuena, and 8 a. m., at which hour the trials were scheduled to commence, the field was filled with an immense crowd, that anxiously and impatiently awaited the promised flights.

After several successful trials, which earned the daring aviator tremendous applause, and when the crowd had gone, quite a serious accident occurred, which, had it not been for the agility of Sr. Lebrija, might have resulted fatally.

This accident took place when the aviator was returning to the hangar after having made an excellent flight, which easily surpassed all others made thus far, making all the turns with ease and having maintained a good height from the time he started until the accident took place. As he was coming along, and on descending, he struck a place where the mud was extremely soft and sticky, causing the machine to skid along for quite a distance and to turn over on its right side, and as the wheels sank into the mud and resisted the forward movement, the frame of the machine broke in two from the force of the impact, the part containing the motor and propeller sticking in the mud. Minor injuries were received by the aviator.

The Captive Balloon "Ciudad de Mexico."

The captive balloon which has been on exhibition in the City of Mexico closed its season the other day and will certainly be missed as an attraction. The ascensions were discontinued on account of the rainy season.

Great crowds would throng the streets to watch the numerous daily ascensions, and many of the most prominent people of the metropolis, including Vice-President Ramon Corral and Governor Guillermo de Landa y Escandon, had the pleasure of making the trip and enjoying the beautiful panorama presented by the Valley of Mexico when looked at from a great height. The weather was generally superb and the atmosphere so clear that the innumerable villages which surround the capital and the cultivated fields and orchards which dot the valley looked like a gigantic checker board.

On the last ascension the pilot, Sr. Manuel Lebrija, who has also made several short flights in the Bleriot monoplane, took up a party of his friends, on which occasion the balloon was freed. The party descended near a railway station, where a lunch which was carried in the basket of the balloon was served.

Mexican Aviator Makes His First Flight.

On July 8, in Guadalajara, on the large and level lands known as "Las Ajuntas," to the right of the private road of the Guadalajara Automobile Club, where plenty of space is to be had for the purpose, though a tree here and there makes it dangerous for the aviator and machine should the latter not be provided with guiding gear, the preliminary public trials of the aeroplane "Jalisco," invented by Sr. Lopez Mejia, a Mexican youth, were held.

The machine was run along the course several times at a pretty good clip in order to test the engine, which was imported from Europe, then the aviator raised his elevating planes slightly and the machine rose about 3 ft. and skimmed along. Finally, after several attempts, an elevation of about 6½ ft. was attained, but on attempting to make a turn one of the main planes struck a tree and broke, which brought the trials to an end until such time as repairs can be made, when another demonstration will be given.

The trial was a success, and showed that the machine would fly. The large crowd in attendance expressed its appreciation by hearty cheers and prolonged applause, and the young inventor was warmly congratulated.

New Aviator Will Fly from San Antonio to Mexico City.

Henry Alfred Schwob, a young French marquis who has come into prominence here through an inheritance of $200,000 gold, is the latest aspirant for aeronautical honors in Mexico.

Mr. Schwob states that a biplane is being built for him at San Antonio, Tex., which will have radical features of his own design which are not used on any of the other aeroplanes, and will be equipped with a 140 h. p. motor, to allow 40 per cent for the loss in power on account of the high altitude.

He also claims to have partially built a biplane with his own hands in Europe and has also made several successful flights in France. He was contemplating flying from San Antonio, Tex., here in his machine, but as he is afraid that there might be long stretches where water and gasoline could not be obtained, and as his machine is a light experimental one and not equipped for carrying supplies, he has given up the idea and will have it sent by express. He anticipates no difficulty in flying with his machine at this altitude. He expects to be ready to make his first flight in about a month or two.

The Monoplane as a Freight Carrier.

Perhaps the first practical adaptation of the aeroplane for freight-carrying purposes in the world is shortly to be made by A. A. Williams, an aviator of Douglas, Ariz., he having contracted with Dr. J. J. P. Armstrong, who owns a placer mine in the Chihuahua Mountains, in the Sierra Madre range, near the city of Chihuahua, Mexico, for the transportation of placer mining machinery from Douglas to his property, a distance of about 300 miles. The machinery in question consists of pieces which can be made up into 100-pound lots. The machine which Williams will use is a monoplane.

When the above notice was brought to the attention of officials of the Mexican government, immediate instructions were given to Sr. de la Barra, Mexican ambassador at Washington, to hurry the signature of the treaty for aerial navigation, which is at present being considered between the United States and Mexico. The Mexican government, when proposing such a treaty to Uncle Sam, not thinking, perhaps, that such legislation would be required so soon for the purpose of regulating aerial freight traffic.

Aeronautical Society Lectures Printed.

The Aeronautical Society (New York) has issued the first of its series of bulletins containing all the discussions and lectures held at the special twice a month meetings. Since last fall stenographic notes have been taken at each of these meetings with this end in view. The first bulletin contains the talk of James H. Scarr, head of the Weather Bureau in New York City.

An abstracted aeronautical dictionary has also been prepared for distribution and copies will be sent to the various newspapers of the country for their use. It is hoped that this missionary work will result in the doing away with such absurd headings as:—

Airship Wrecked at Mineola.
Dr. Walden Injured in Monoplane.

which appeared in several of the New York afternoon papers recently. Even in Philadelphia the Aeronautical Editor is up on the new Art.

FLYING OUT ON THE PACIFIC COAST

THE WISEMAN-PETERS BIPLANE

By Cleve T. Shaffer.

EXCEPTING power plant, this machine would appear at first glance to be an exact duplicate of the Farman machine in which Paulhan made his height record at Los Angeles, but on closer inspection a number of modifications and some improvements may be observed. For instance, the diagonal cross strut, or stay, on each skid, Curtiss lateral control by shoulder brace, and elevator and rudder control by wheel: skids on ends of plane; skids on rear cell, which on striking the ground allow the rear edge of the lower plane to swing up and thus avoid injury in landing. One noticeable defect, to the writer's mind, is the flatness of the planes, the camber being only 1 in 36, which, no doubt, accounts for the large horse power and high incident angle. It is claimed that this machine has flown with a 30-35 horse power motor, but evidently results were not satisfactory as a 60 horse power is now installed.

The machine is of very neat construction and workmanship, though the sockets appear cumbersome and have altogether too much head resistance. Except on rudder, elevator and aileron controls, where Roebling "aviator cord" is used, oil-tempered steel wire is used throughout, No. 12 guying the planes, No. 9 attached to skids and No. 6 between skids. Ferrules are used in fastening. Efficient turnbuckles of their own design are used, a small one testing 1,149 pounds, a medium and a large testing (stated) 4 tons. They consist of a McAdamite body of suitable shape into which screws the eyes by right and left-hand threads, a lock nut on one of the eyebolts is screwed against casting or body end and locks.

The skids extend out in front quite a bit further than in the Farman, ferruled end being guyed to frame in usual manner.

Spread is 32 ft., length 42 ft., surface 372 ft., weight 850 pounds without operator.

Planes.—32 x 6, lower cut out to beam for propeller, are double covered, ribs and beams enclosed with Naiad No. 6; beams are laminated, front 1¾ x 2½, rear 1½ x 2¼; ribs are built up, nailed and glued to beams, camber 2 in., 30 in. back from front edge; struts, oval, 1½ x 1 in. center cross section: ½ x ¾-in. ends. Incident angle very high for biplane practice, though measured, is not to be made public as yet.

Chassis.—Regular Farman type—Two skids and four wheels, with the addition of a diagonal cross strut from underside of lower rear beam to skids in front of wheels. Chassis struts are 1½ x 2¼ in., cross section oval. McAdamite sockets of suitable angle. Holes drilled into casting are used for guy-wire fastening; this is not very good practice unless some sort of a bushing is used, as the vibration of the wires wears the metal appreciably. Am indebted to Mr. Peters for this information, which I believe is not generally known. Skids are of hickory 1½ in. wide, 2¼ high. Wheels are 28 in. with a 2¼-in. tire, steel rims, narrow hubs and babbitt friction bearings, are 33 in. apart on a 2¼-in. axle, held in place on inside by stay collar and outside by a cotter pin. An eyebolt set in the skid takes the ends of the two ¾-in. 18-gauge stays, other ends fastening to collars on axle. The method of hanging skid is ingenious: the skid passes through two rectangular links of ¼-in. iron, which engage grooves on bottom of skid. Heavy leather straps, adjustable by a buckle, fasten the links to two other links of 1¼-in. square-moulded rubber; these latter pass over axle and are held in place by wooden shoulders bolted to axle. Light skids are pivoted from rear beam at each end; wires with a rubber elastic medium, to take up shock, run from middle of skid to front beam.

Controls.—The elevator axis is at a point 12 ft. out in front, a McAdamite casting connecting the two spars and serving as a bearing for the shaft. This is placed a little forward of center of the double-covered plane, which is flat on the bottom, size 3 x 8 ft., and works in conjunction with a flap hinged on the upper rear surface. Three posts are placed on the front and two on rear. Tail planes are 8 x 6 x 6 ft. apart, supported by two skids (see general description). The front edge is 14 ft. 3 in. from rear edge of main planes. Outrigger spars are two-ply laminated, 1 1/16 in. square section, struts same size as in main planes, 48 in. apart.

The rudder is 4 x 6 ft., placed between planes on front middle strut. A cord prevents more than 18-in. movement to each side.

Ailerons, 1½ x 6 ft., hinged to rear beam by three hinges.

Steering wheel, automobile, spider bored out to lighten, post pivoted at center (see photo) between seat and engine base frame, to which are mortised and bolted the V's which hold the stationary foot rests. Aluminum treads are placed on these, giving the machine a finished appearance.

The shoulder brace is laminated and the seat of wickerwork.

Power plant.—A 60 horse power Hall-Scott 8-cylinder engine drives direct a 7 ft. 8 in. Hall-Scott propeller of about 4½-ft. pitch—not uniform; blade 12½ in. wide with ½-in. camber at this width. Thrust at 1,400 r. p. m. (stated), 280 pounds. Shaft approximately horizontal in flight. Motor is equipped with a Bosch magneto. Gear water and oil pumps. Oil tank fixed to base of motor. Radiator placed over and in back of operator. Gasoline tank, three-gallon, supported by wires. Engine and seat base clamped to beams by ⅜-in. U bolts.

On July 24 three flights of about a mile each were made without accident, including turns. The machine handled excellently with J. W. Peters pilot.

AERONAUTICS is greatly indebted to the courtesy of the owners for allowing its representative to go over the machine so thoroughly and secure the above valuable data for publication. Mr. Don C. Prentiss and Mr. J. W. Peters were especially kind.

O'Brien Flies Farman Type.

Clifton O'Brien, of the Pacific Aero Club, has a Farman-type machine. He reports having made several flights, longest being about a quarter mile. In his last flight he rose from the ground in a run of 75 ft. and while flying along at a height of 20 ft. was caught in a downward eddy that swirled around the grandstand and tipped him over to the left at an angle of nearly 45 deg., despite his manipulation of the ailerons. He finally recovered his lateral control, but in the meantime lost in the fore and aft direction and the machine, which was probably too lightly built, struck the ground violently and was wrecked. Mr. O'Brien escaped injury.

The machine is 31 ft. spread by 42 ft. fore and aft. Planes 31 by 6 ft., curvature 1 in 32. Weight of frame without power plant, 376 pounds. Weight complete, 820 pounds.

The power plant consists of a Hall-Scott 8 cylinder 60 horse power engine, driving direct a Hall-Scott 7 ft. 6 in. by 4-ft. pitch propeller. The thrust claimed is 285 pounds. A "Sunset" radiator of but 15 pounds weight does the cooling.

The biplane is almost a duplicate of the Wiseman-Peters completely described in this issue, having the same sockets, ribs, struts, control and general dimensions and power plant. As pointed out by the writer in the description of the latter machine, the small camber of the surface necessitates a greater angle of incidence and a correspondingly greater horse power.

Leyland Bryant and Louis Fortney, of San Francisco, who recently completed a large Antoinette type monoplane, wrecked the machine on each of its two trials and are now at work dissembling the remains, having given up active participation in the conquest of the air. They will sell the 60 horse power auto engine with which the machine was equipped.

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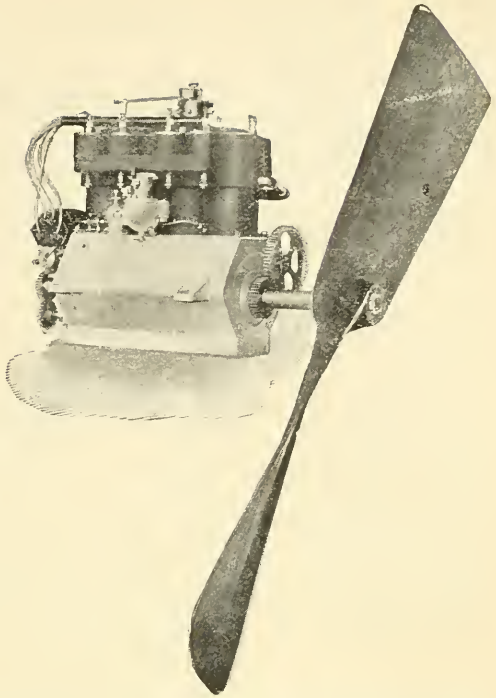

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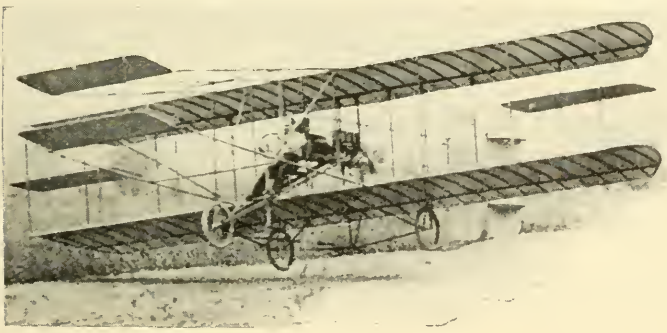

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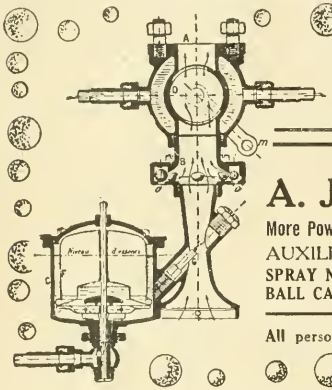

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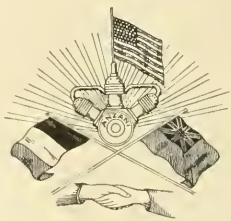

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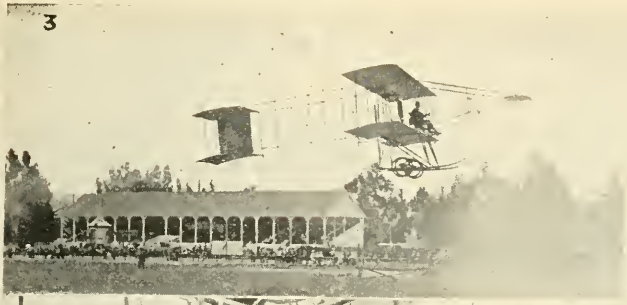
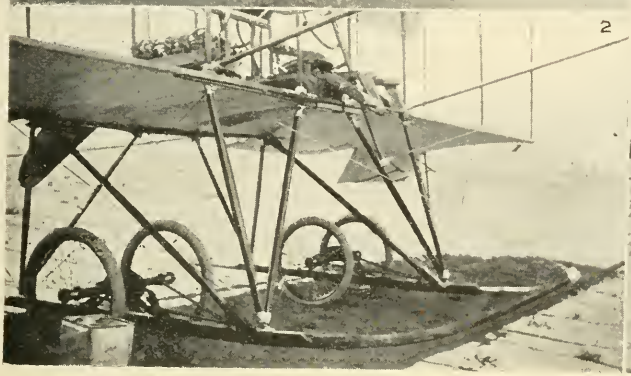
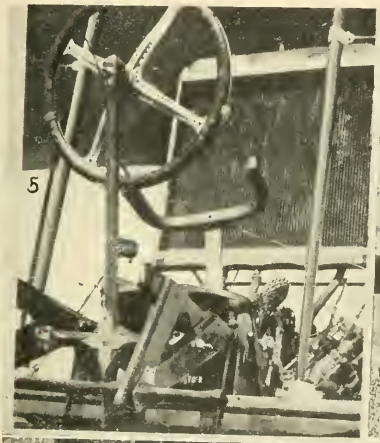
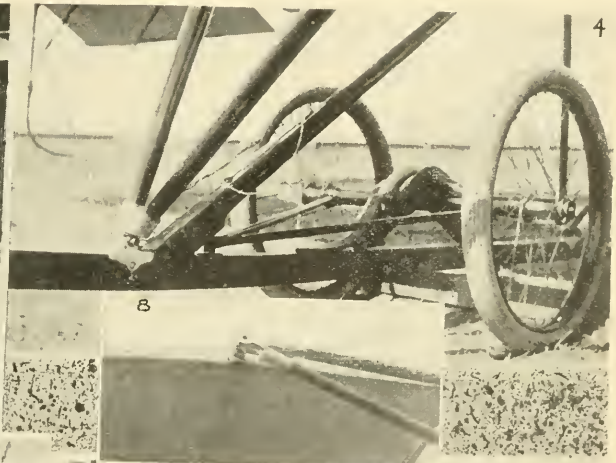
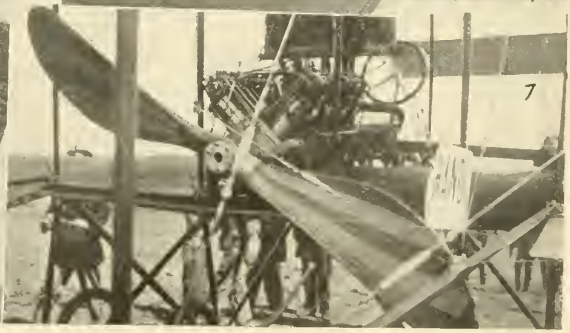










THE WISEMAN-PETERS AEROPLANE.

1—Shows flatness of angle and plane skids.
2—Running gear; note diagonal struts to skid.
3—Machine in flight, July 24, at Petaluma, Calif.
4—Skid and wheels. 5—Control detail, showing shoulder brace and wheel; also type of sockets.
6—A close view of the rubber shock absorber.
7—The Hall-Scott power plant.

THE STEVENS MONOPLANE

By Chas. E. Schmerber.

THE Stevens monoplane, built by Wm. Stevens, of Los Angeles, Cal., which lacks but the motor to go on its trials, embodies some new ideas in monoplane construction.

Frames. The framework consists entirely of steel tubing, except the ribs and lateral beams of wings. These are hollow wood, wrapped with muslin tape and glue, then wound diagonally with piano wire. All joints are brazed. The body is of hexagonal design properly braced by steel wires equipped with turn buckles.

Planes. The width of the main planes is 32 ft. over all with a depth of 10 ft. tapering to 3 ft. at the tips. Width of rear plane is 9 ft. 6 in., and depth 10 ft. The total length of the machine is 24 ft.

Running gear consists of three caster wheels 26 x 2¼, spread of the front pair being 7 ft. 6 in., all wheels being pivoted with spring suspension.

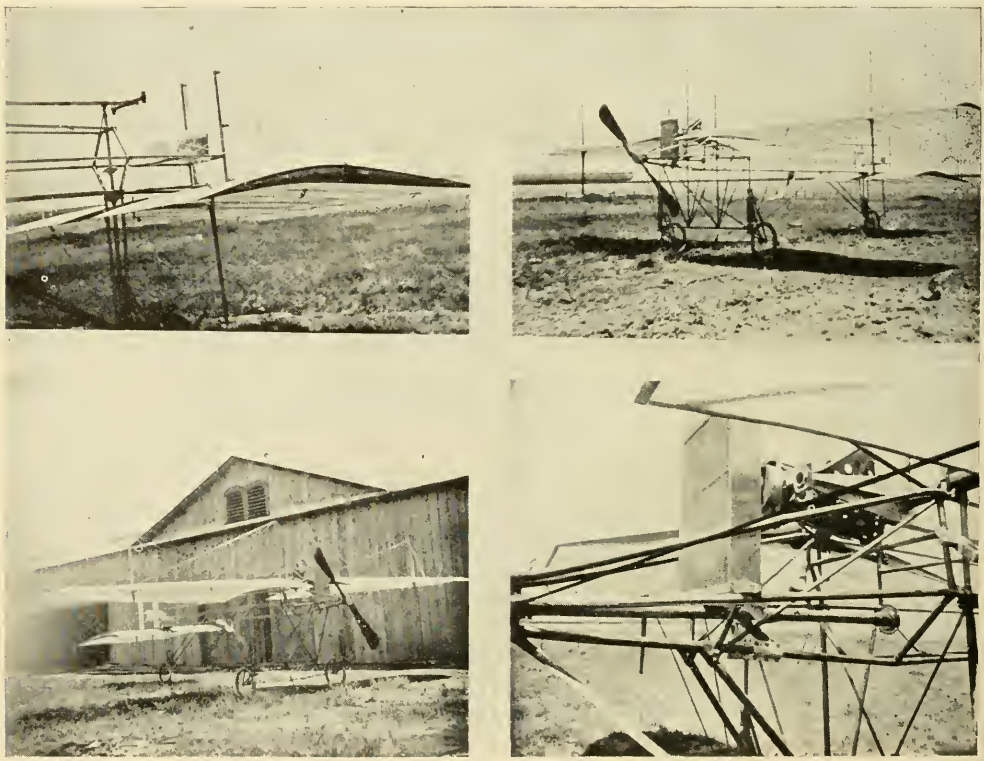
Propulsion. The diameter of the propeller is 8 ft. with 10 degrees pitch. The motor has been built by Buel H. Green, of Los Angeles. The engine is an eight-cylinder set at 90 degrees, "V" type, 50 h. p.; the bore is 100m/m, the stroke is 130m/m. The cylinders are made of high carbon steel, turned from the solid billet, the pistons are low carbon steel with cast-iron rings; the cylinder jackets are of spun copper, and the cylinder heads are water jacketed cast iron; the valves are placed at an angle in the cylinder head, and are operated by a cross beam from the cam-shaft, which has four double throw cams, each cam operates the valves for two cylinders. Connecting rods and crank shafts are made of Vanadium steel, the crank case is aluminum, carrying at each end large annular ball-bearings which support the crank-shaft, F. & S. ball-bearings also are used to carry the cam-shaft as well as for rollers in the valve plungers. Mr. Stevens is also using a special turn-buckle which Green is making for the aeronautic trade.

Both inlet and exhaust valves are of generous proportions, being 50m/m diameter, so as to offer as little resistance to the passage of the gases as possible.

Control. The control of this monoplane embodies some new ideas, the lateral stability being maintained by the main supporting planes in this way: The planes are pivoted in their center of pressure and independently of each other, and can therefore be offset, viz.: one plane can be given a greater angle than the other. The scope of angles is from 3 degrees negative to 18 degrees. Both the elevating and offsetting of these planes is ingeniously effected by the movement of one handlebar in front of the aviator in such manner that swinging this handlebar upwards in a vertical plane gives a larger angle to the plane on that side, thereby righting the machine. By pulling the handlebar on the left towards you, gives the planes an angle of 3 degrees negative and the opposite movement gives 18 degrees positive. As can be seen by the photograph, the aviator sits over the rear plane, back of the rear wheel and just in front of the direction rudder.

The weight of the machine when fully equipped and including aviator will be 1,000 pounds.

The double surface direction rudder is operated by the feet on a cross lever connected up by wires through pulleys.



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AT THE LOS ANGELES AERODROME

By Prof. H. LaV. Twining.

Three machines now at the Los Angeles Aerodrome are endeavoring to fly. J. J. Slavin, with his biplane, has made a flight of 50 ft. The aerodrome is one mile in circumference, thus making it 1,760 ft. in diameter. Part of this distance is taken up by the motordrome track and the inner field fence. This leaves but 1,000 ft. clear space in length. This is too restricted a space for amateurs, as it takes a large part of the distance to clear the ground, and one must alight within a small distance to avoid running into the fence.

A track outside of the enclosure has just been completed. This track is over a mile in length, and Mr. Slavin intends to try out his machine on this track on Aug. 5. Slavin's biplane differs from others in the arrangement of the main planes, in order to secure automatic lateral stability. The resistance under one plane causes that plane to shift the opposite plane automatically. The same is true of the fore and aft stability.

The Eaton-Twining machine has been running around on the ground endeavoring to fly. This machine is a monoplane of the Bleriot type. It differs from that machine in having sliding planes for securing lateral stability, instead of ailerons or warping. The machine is making daily jumps of 10 to 50 ft. On one occasion it rolled over on its back. Warren S. Eaton was driving the machine. The main planes had not yet been put on. In making a turn the machine skidded and turned over sideways, landing on its back. Warren escaped unhurt.

On another occasion the axle broke, and as the machine was traveling some 25 miles an hour, it pitched over on its nose. Warren Eaton was the driver and he again escaped unhurt.

Mr. Slavin's machine is equipped with a Werner motor, made in Los Angeles. It is a 30 h. p. 4-cylinder water-cooled motor. The Eaton-Twining machine is equipped with a Ford automobile engine, "T" model, 4-cylinder water cooled, 22½ h. p. Total weight of power plant is 200 pounds. Weight of machine with aviator is 700 pounds. Up to the present time a thrust of 180 pounds has been obtained at 1,400 revolutions.

George Deussler has built a machine of the Farman type, equipped with a Mitchell automobile engine of 300 pounds weight and 30 h. p. He has been off the ground with this machine and in a try out on July 31 the front control broke. The wind blew it back into his face and cut the bridge of his nose. He escaped otherwise unhurt.

The Greer-Robbins machine is a monoplane of peculiar construction. This machine is equipped with an "N" model Ford automobile engine. It has made a flight of some 95 ft. This machine is probably the second machine belonging to a member of the Aero Club of California to leave the ground, the Gill biplane being the first. The Gill machine is a Farman type so that the Greer-Robbins is the first monoplane invented by a member of the Aero Club of California to clear the ground. There are some ten other machines at the "acrage" in various stages of construction.

The Aero Club of California's Aerodome

The Eaton-Twining Machine

Praise for "Aeronautics."

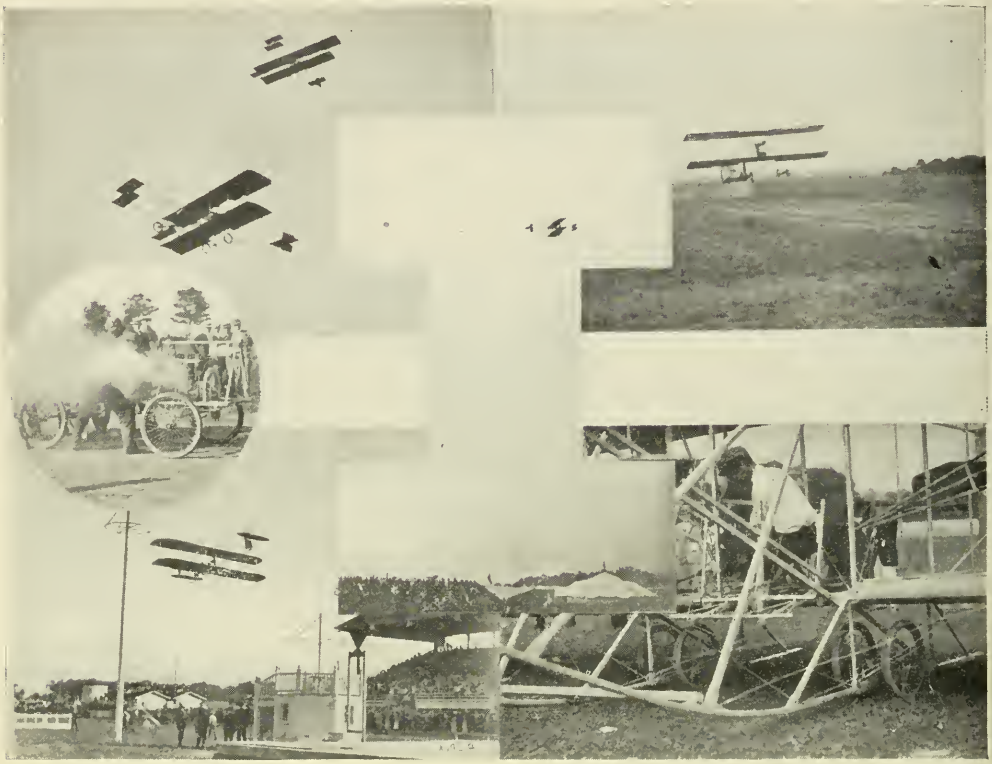
DEAR SIR:

I have read your editorial note for July with admiration and enthusiasm, and note your splendid advertising patronage, and its logical nature, with real astonishment. Your periodical has been as complete, world-wide and nearly as wonderful as the triumph of Wilbur and Orville Wright.

I am only a literary man of 60; I have stuck to my trade and have beheld the death of nearly all illusions. Yet the scientific progress since 1876, the phonograph, telephone, the dynamo, spectroscope, turbine, X-ray and radio-activity, and finally the Wrights, have kept me alive to the interesting character of this otherwise unpleasant world. Wonderful! Wonderful! One may be an inquiring little child at 60!

JOHN MCGOVERN,
632 North Central Ave., Austin Station.
Chicago, Ill.

MEETINGS COMING, GOING AND GONE



Curtiss Flies Over Mars at Omaha. Windwagon at Detroit. Brookins Flying at Detroit.

Brookins Just Before his Accident at Asbury Park.

Curzon Flying his Farman at St. Louis Novice Meet. The New Wright Chassis.

Asbury Park.

Aug. 15.—The success of the Wright Meet which opened at Asbury Park, August 10, under the auspices of the New Jersey Aero and Motor Club, was marred on the very first day by the injuring of several spectators when Walter Brookins smashed his machine at one end of the grand stand. The machine used was the first Wright machine to be seen in public with wheels and the flight was the very first one that had been made. The wind at the grounds was very strong and at times the aeroplane almost stood still. Gliding down from a height with the engine shut off, Brookins was just about to touch the ground, so eye witnesses state, but right in front of him were newspaper men and photographers. To avoid these, Brookins, with the little headway he had, turned up again to clear them but he did not have speed enough. Turning the machine quickly toward the most available spot, it landed on its nose and was smashed, and Brookins somewhat hurt. The spectators who were injured, and several quite seriously, were struck by the machine in making its landing. The highest wind velocity between 1:00 P. M. and 6:00 P. M. that day, according to the nearest weather bureau station, at Long Branch, was 24 miles an hour. Hoxsey, immediately after the accident, went up for five minutes, and one of the hot air balloons was sent up.

The Wright aviators at the Meet are: Walter Brookins, Frank Coffyn, Duval La Chapelle, Arch Hoxsey and Ralph Johnstone.

Up to 3:00 P. M. every day there is an exhibition of kite flying given by A. E. Wells with his outfit of all kinds of kites, and by the Signal Corps of the New Jersey National Guard using Eddy kites. Every day that the weather permitted Fred L. Owens has been going up in his dirigible. Johnny Mack gives each day an exhibition of single and double hot air balloon ascents with parachute drops. The field is one of four acres enclosed by a 15-ft. canvas fence.

The accident seemed to double the sale of seats the next day when 10,000 persons were present. Wilbur Wright came on from Dayton to visit Brookins and saw Johnstone and Hoxsey fly, and in a contest, alight in a pre-arranged space.

PARACHUTE JUMPER KILLED

The third day saw the death of Benny Prinz who was killed in making a double parachute drop, the second parachute failing to work. He must have fallen from a height of about 1,000 ft. Two men were in the balloon, Samuel Hartland, and Prinz. Hartland had already cut loose from the balloon and reached the ground safely in the single drop. Governor Fort was present and saw the flights, leaving just before the fatal accident.

On this same day Hoxsey and Johnstone were both in the air at the same time making short turns and dips, and cutting fancy figures. Hoxsey went up to 1,800 feet, the highest that he has yet been.

Johnstone made his longest flight Saturday, remaining up 35 minutes and attaining an altitude of 3,900 ft., the end of his descent being at a sharp angle with the engine cut off. During this flight the dirigible was sailing around and Hoxsey did "stunts" many hundred feet below Johnstone. Coffyn also flew.

Sunday there was no flying and to-day a rain storm prevented. The meet has six more days to run.

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(*Concluded from page 78*)

hot, sultry atmosphere to dry, wet or cold, or the effect of rarified atmosphere at high altitudes; in fact, the combinations of tests which may be made are numerous.

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Omaha, July 23-27.

By T. T. Tuttle.

The Omaha (Neb.) meeting, on July 23 to 27, was held under the auspices of the Aero Club of Nebraska, and was particularly interesting owing to the fact that every type of craft that navigates or sails the air participated. There were two hot-air balloons, a captive, a free balloon, a dirigible balloon and three Curtiss aeroplanes in the air each day.

The chief attractions, however, were aviators Glenn H. Curtiss, J. C. Mars, J. A. D. McCurdy and Eugene B. Ely.

The weather made it a difficult task for the aviators to open the first day with their best work.

Weather conditions on the second day were about the same as the day before, but in spite of this handicap all aviators made flights. The program closing with a spectacular race between Curtiss and Mars. In the evening the U. S. Dirigible No. 1 left Fort Omaha with Lieut. Haskell in charge and could be plainly seen from the aviation field.

U. S. DIRIGIBLE BREAKS CRANKSHAFT.

About 6:30 P. M., July 24, Dirigible No. 1, with Lieutenant W. N. Haskell, Signal Corps, as pilot, and Sergeant Ward as engineer, started from Fort Omaha, Neb., for the Aviation Field. A good start was made and the balloon rose about 200 ft. in the air—everything apparently working in first-class condition. A couple of circles over the Fort were made and then the balloon was headed for the Aviation Field about four miles away. The conditions were very good with only a slight wind behind the balloon. Shortly after starting and still while over the reservation, the engine stopped due to a break of the crank-shaft. This precluded any further attempt with the dirigible until repairs could be made.

On July 26, captive balloon, No. 9, was inflated in the balloon house at Fort Omaha and towed about 2½ miles across country to the Aviation field. This was accomplished in 1 hour and 50 minutes. Upon arrival at the Aviation Field the balloon was put in operation and several ascents made between 6 and 7:30 P. M. Mr. Glenn Curtiss made several flights in his aeroplane around the balloon while it was in the air.

On Monday the wind increased in velocity and it was impossible for the aviators to make anything more than short straightaway flights.

NEW SHORT START RECORD.

The government captive balloon was blown loose from its moorings late in the afternoon and landed a mile from the grounds after the rip cord had been pulled automatically when it parked loose from the winch wagon on the grounds. Many thousands of spectators stuck until the last announcement was made that "wind checks" would be honored the following day at the gate. It was in the face of this wind that Mars rose into the air in his four-cylinder Curtiss 30-30 horse power machine after a run of 53 ft. 6 in., establishing a new U. S. record for short start and earning thereby a silver trophy offered by a local paper.

Tuesday and Wednesday, the fourth and fifth days, the weather conditions were more suitable for good flying, the wind velocity having dropped down in the late afternoon on each of these days. Curtiss, Mars and Ely drove their machines at will and each day Curtiss and Mars raced around the field at a height varying from 100 to 300 ft. The attendance on each of the last two days was more than 10,000. On Tuesday evening the captive balloon was refilled and made an ascent with Mrs. Mars, wife of the aviator, and W. H. Sutton, of the Curtiss company, as passengers.

At the close of the meet Curtiss was awarded by one of the local papers a heavy silver water pitcher for making the most daring and spectacular flight during the meet. This flight was made on the first day of the meet when Curtiss flew out of the grounds and out over the country, which was covered with fences, gulleys and trees, in the teeth of almost a gale.

Pittsburg (Pa.), Aug. 4-6.

By Earl O. Gunther.

The Pittsburg Aero Club held its first meeting Aug. 4 to 6 at Brunot Island race track. There were four biplanes present, three Curtiss and the Baldwin. The aviators were Curtiss, Mars and Capt. Thos. Baldwin. The official timer and recorder was Augustus Post.

The first day of the meet there was only one straightaway flight made, by Mars in a gusty wind of 35 miles an hour.

The second day all three aviators made flights, Mr. Curtiss making the first and most spectacular. His first flight, in a wind of 25 miles an hour, circled the mile track twice, with remarkable skill at balancing in a gusty wind. His longest flight for this day was about six miles. He also made trial for short starting, arising in 81 ft. 2 in., officially measured. The wind was very gusty not allowing very much flying this day.

ANOTHER NEW SHORT START RECORD FOR U. S.

Mars was able to get off the ground in 35 ft., making another new short start record.

The third day of the meet was windy and the aviators were hampered very much by it. Curtiss again made the most spectacular flights, flying out over the river. Mars made a series of short circular flights around the mile track. Capt. Baldwin made only straightaway flights. Great enthusiasm was created by the flights of Curtiss and Mars, Curtiss flying above Mars and in the same direction and at the same time.

The last day of the meet broke all records for crowds at the track and thousands of people were on the surrounding hills watching the flights.

Decatur (Ills.), July 16-17.

Charles F. Willard (Curtiss) flew before good crowds in Decatur, Ills., July 16-17. On the first day he made a cross-country out of the field and back, estimated by local experts as 30 miles, in a flight lasting 40 minutes.

St. Louis Show Date Changed.

The date of the aero show at St. Louis has been changed from October to November 17-24 to avoid conflict with outdoor events on Hempstead Plains.

Toronto, Canada.

There were nine days of flying, participated in by Ralph Johnstone (Wright), Count Jacques De Lesseps (Bleriot), Duval La Chapelle (Wright), Walter Brookins (Wright) and Frank T. Coffyn (Wright), July 8-16, except Sunday. Count De Lesseps flew from the grounds, which were located on the Trethewey Model Farm, about eight miles from the center of Toronto, over the heart of Toronto and back, duplicating his Montreal feat, and once flew to a height of 2,700 ft. Ralph Johnstone made two remarkable flights and seven in all, once battling an extremely high wind at an altitude of 3,400 ft., and on another flight executing all sorts of maneuvers of which the Wright aeroplane is capable, aerial "roller coasting," sharp circles and spirals, skimming the ground, etc. The newspapers divided the honors between Johnstone and Count de Lesseps. Five thousand to fifteen thousand daily was the attendance.

BLERIOT LANDS IN TREE.

The Carruthers "Bleriot," flown by Stratton, ran into a tree. He lost consciousness during his jump and when he came to his senses he found himself in the top of a pine tree 30 ft. from the ground. He said he did not know how he got there. "It was funny."

Samuel F. Perkins, whose specialty is kite and banner flying, filled in all gaps in the program. The banners could be seen from incoming trains and indicated the location of the grounds. Before and during the flight the kites could be seen high in the air. These now are one of the necessities of aviation meetings. Harvard is the next on the list for the kite exhibition. Here he will attempt to lift a man up by kites. It is estimated the pull will be about 1,500 pounds, taking 10 or more 15-ft. kites.

St. Louis National Novice Meet.

BY E. PERCY NOEL.

Although eight machines were on the field the opening day of "First National Aviation Meeting for Novices," July 11, only two got off the ground during the week and the prizes were all won by one man on account of an accident to Howard W. Gill, while practicing on July 12. J. W. Curzon (Farman) won $300 in three prizes by flights made July 14 and 15. There was no competition on July 12, 13 and 15. On July 11 Gill flew 25 yards and landed in a ditch disabling his machine for the day. On July 12 while practicing in the evening, Gill flew half a mile outside the field. Something went wrong with his elevating control and in his inexperience he dropped from 40 ft., smashing half of the machine. He picked himself up but was confined to the hospital for three days.

July 14 was a good day for Curzon, flying 92 yards on his first trial and 113 on his second, winning his debut prize of $100. Later he won the $100 daily prize for the first flight of 200 yards, traveling 322 yards straightway after 113 yards and then touching. Rain interfered on July 15.

On July 16 Curzon made a flight of about 500 yards, winning the $100 daily prize. The meet was continued July 17, but wind prevented flying until after official timing closed, then Curzon flew 186 yards. Curzon and Gill have both made permanent headquarters on the Washington Park aviation field of the Aero Club of St. Louis.

On August 13, Hillery Beachey, flying one of Gills' biplanes without front elevator, made two circuits of the course without stopping, about 1½ miles.

Dr. J. J. De Praslin, of Nicaragua, has ordered material from the Aeronautic Supply Co. for the construction of an aeroplane here.

Chas. Kuhno had a monoplane that was equipped with a Curtiss 8-cylinder 40 h. p. engine that looked very promising, construction and designing above the ordinary.

Robinson's monoplane of the Bleriot type, equipped with a 3-cylinder Elbridge motor, did not get up enough speed to make a getaway from terra firma, although the construction was very good.

Zehler's monoplane was a machine that differs from the general run of flyers, and if you are able to get a photo of it, you could probably understand same better than the maker. Equipped with a 4-cylinder 4-cycle marine engine, it was unable to make a speed of more than five miles per hour.

Sparling's Curtiss type bi-plane, equipped with a 4-cycle Elbridge was very neatly made and looked promising. It was mounted on Farman type running gear.

Curzon's "Farman" biplane seemed as though it had seen better days, although of the standard type of a past season was still in the ring. The big Vivinus motor does not give power enough to enable the machine to make extended flights. Those made have been but short ones.

SEVEN AEROPLANES SMASHED BY WIND.

A few days after the Novice Meet at St. Louis, a terrific storm blew down the tent which housed the aeroplanes, demolishing 7 machines. Nothing was saved of Curzon's Farman but the engine and propeller. Howard W. Gill's machine was unharmed as it was housed in a wooden shed.

Detroit.

At Detroit, La Chapelle, Hoxsey and Brookins made sensational flights and delighted the management and large crowds. The Wright machines will return to Detroit in September.

Lexington, Ky.

J. A. D. McCurdy filled the Curtiss date at the Lexington, Ky., State Fair, Aug. 7-13, making several flights each day of the exhibition.

Grand Rapids.

Mars (Curtiss) was to have flown here July 16-17, but the high wind prevented flights both days.

New York, Aug. 19-21.

Glenn H. Curtiss, J. C. Mars, J. A. D. McCurdy, C. F. Willard and Eugene Ely are scheduled to give a 3-day exhibition at the Sheepshead Bay racetrack, New York, Aug. 19-21.

Eugene B. Ely, a Curtiss aviator, began practicing at Sheepshead Bay racetrack in preparation for the exhibition on the 19th, using for the first time the 8 cylinder Curtiss engine which is slowly being installed in all the exhibition machines.

J. A. Douglas McCurdy, former member of the Aerial Experiment Association, who with F. W. Baldwin, another member, formed the Canadian Aerodrome Co. at Baddeck, Nova Scotia, has signed a contract with Glenn Curtiss to fly a Curtiss machine. His first appearance was at Omaha, July 23-28. From there he went to Lexington, Ky., Aug. 7-13. Eugene Ely of Portland, Ore., who has been flying a Curtiss machine for E. Henry Wemme, Curtiss agent of that city, is another addition to the Curtiss troupe of aviators.

Augustus Post, former secretary of the Aero Club of America, has bought a Curtiss machine under a special arrangement, and will fill exhibition contracts wherever they do not conflict with Curtiss' interests, or will fill engagements obtained by Curtiss. He will begin practicing under the able tutorship of Charles F. Willard, using a machine which Willard has been putting in shape in the Aeronautical Society's shed at Mineola.

Clifford B. Harmon has ordered a fast machine from Glenn Curtiss, in which it is expected he will install his Gnome engine for trial.

Harvard Aeronautical Society to Hold Aviation Meet Sept. 3 to 13.

The Harvard Aeronautical Society, of Cambridge, Mass., will hold an aviation meet at Atlantic, Mass., from Sept. 3 to 13th, inclusive, with the exception of the two Sundays intervening. The programme of events and prizes already scheduled are as follows:

Speed: 1st, $3,000; 2nd, $2,000; 3rd, $1,000. Altitude: 1st, $3,000; 2nd, $2,000; 3rd, $1,000. Duration, $2,000 and $1,000. Distance, $2,000 and $1,000; Slowest Lap, $1,000 and $500. Getaway $100 and $50. Accuracy, $500 and $250.

$10,000 PRIZE.

To which must be added the premier event of the meet, for which the Boston *Globe* offers a cash prize of $10,000; the condition of this contest being a flight from Atlantic to Boston Light and return against time. For novices there will be additional events and prizes.

A large number of entries from the ranks of the leading aviators of America, England and France have already been received by the Society, assuring the success of the meet, which is not only the first to be held in New England, but by far the most important attempted in America up to the present time. Additional entries will be received and full detailed information furnished prospective entrants at the temporary headquarters of the Society, No. 164 Washington St., Boston, Mass.

The grounds cover 500 acres, on Dorchester Bay, and are surrounded on three sides by water.

SPECIAL $5,000 PRIZE.

The announcement of a $5,000 prize and the Harvard Cup is offered the aviator who, during the meet, makes the best record in dropping bombs on a battleship model, which is to be set up on the field, marks that event not only as one of the most interesting of the meet, but one which the Society deems most important from the standpoint of scientific investigation.

Bennett Race Changed to Belmont Track.

There are 10 entries in the Gordon Bennett aviation race to be held at Belmont racetrack, near Jamaica, L. I., during the week of Oct. 15-23. As follows: France, 3; Italy, 1; England, 3; and America has the naming of 3. France is the only country which has named her representatives, as follows: Alfred Leblanc (Bleriot), who was a contestant in the 1907 Gordon Bennett balloon race from St. Louis; Hubert Latham (Antoinette); Rene Labouchere (Antoinette).

Plans for the meet, and the events which are

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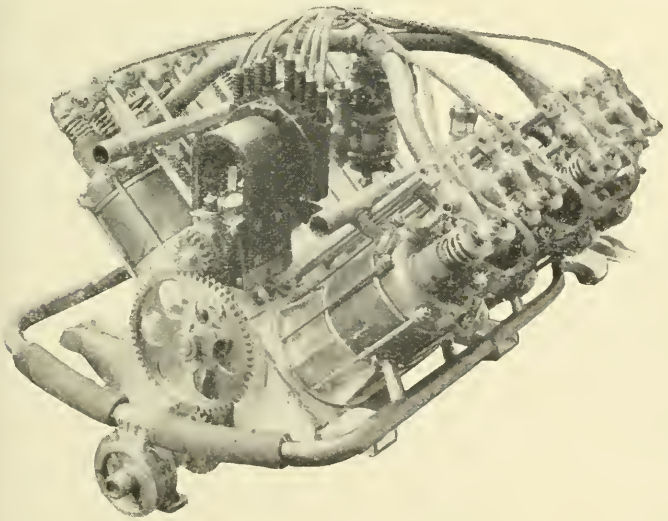

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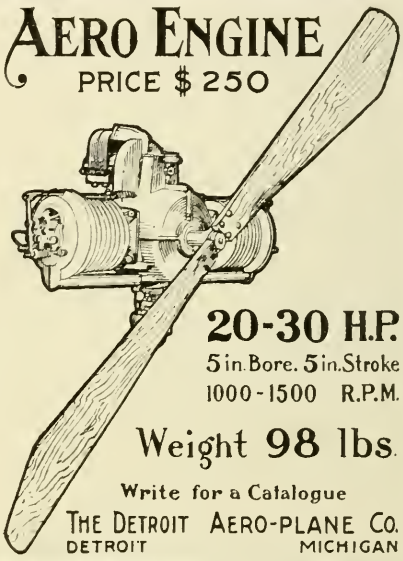

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promised to be held in addition during the week, have apparently not developed very far as yet. Not a single announcement of prizes has been made, and it is now very late for foreigners to figure ahead. Unless announcement is made very shortly, aviators of other countries will have made their arrangements for that period at various European meets.

Following on the heels of a disagreement with Gage E. Tarbell, who was the Aero Club's general manager for the meet, Belmont racetrack was made the place for the Gordon Bennett aviation race and other events, instead of Hempstead Plains as at first planned. L. L. Gillespie stated to-day, Aug. 15, that the amount figured to be necessary, $110,000, had all been raised. "This will be the biggest meet of the year," Gillespie said, "$50,000 being offered by the committee in prizes"; and that the magnitude of the affair will be such that no aviator, American or foreign, whether for financial reasons or for the sake of glory, can afford not to take part. Referring to the rumors that Curtiss might not be on hand to defend the cup by reason of the fact that arrangements are alleged to have been made that the Wright company shares in the gate receipts, Mr. Gillespie said that Curtiss would, of course, be asked to take part, but that the acceptance of the invitation was up to Curtiss and he could do as he liked.

The meet will be financed by the Aero Corporation, Limited. August Belmont has been chosen president of the meet. The executive committee is composed of the chairmen of the various committees, as follows: L. L. Gillespie (Finance Committee), Allan A. Ryan (Arrangements Committee), J. C. McCoy (Aviation Committee), and Andrew Freedman, chairman.

Five Wright aviators will fly, and it is expected eight or ten foreigners will appear.

At the Aero Club of America no information could be had as to the foreign contestants.

FAST WRIGHT MACHINE.

The Wright company is building a special racing machine which may be entered to defend the cup. At the same time, Curtiss is also working on a machine designed to be capable of beating the speed expected to be made by others in the Gordon Bennett. It is very likely that to defend the cup successfully a machine will have to go 70 miles an hour. The 100 h. p. Bleriot made 66 m. p. h. at Rheims in July. Clifford B. Harmon has ordered a Bleriot, in addition to his Curtiss.

Clifford B. Harmon Adds $1,000 to Times Race.

Clifford B. Harmon, chairman of the national council of the Aero Club of America, has offered $1,000 in cash or plate to the contestant in the Chicago-New York race who first covers 500 miles in the first 50 consecutive hours.

Gordon Bennett Balloon Race.

Six countries have entered 14 balloons in the Gordon Bennett race on October 17, as follows: France 3, Germany 3, Italy 2, Switzerland 2, Denmark 1 and U. S. 3. Only the German entrants have been named to date. They are: Hauptmann Von Abereron, who was in the 1907 Gordon Bennett at St. Louis, Lieut. Vogt, Ing. Hans Gericke.

In the elimination race to pick the American team, Sept. 17, Alan R. Hawley and Post will have one balloon, C. B. Harmon and Capt. Baldwin a second and possibly A. H. Forbes will be sufficiently improved in health to take part. A. T. Atherholt from Philadelphia will be another. St. Louis is likely to have more than half a dozen entrants. A. B. Lambert is sure to go in, G. L. Bumbaugh, St. L. Von Phul, H. E. Honeywell and W. F. Assman are strong probabilities.

Aero Calendar for the United States.

Aug. 10-20—Asbury Park, N. J., Wright aviators, Owens dirigible, etc.

Aug. 17—Warehouse Pt., Ct., Chas. F. Willard.

Aug. 19-21—Sheepshead Bay, N. Y., Curtiss exhibition, with G. H. Curtiss, Willard, Mars, Ely, McCurdy, Post and Baldwin.

Aug. 20—Quincy, Ill., flights by Lincoln Beachey.

Aug. 23—Bradford, Pa., C. F. Willard at Elks' Carnival.

Aug. 26—Curtiss to fly from Cleveland to Cedar Point and return, over Lake Erie, about 60 miles each way.

Sept. 3-13—Boston aviation meet of Harvard Aeronautical Society. Curtiss, Willard (Curtiss), Wright machines and others.

Sept. 5-9—Hartford, Ct., Wright aviators.

Sept. 5-10—Minneapolis, Minn., Wright aviators.

Sept. 5-10—Hamline, Minn. at State Fair. Wright aviators and J. C. Mars (Curtiss).

Sept. 5-10—Lincoln, Neb., Wright aviators.

Sept. 6-10—Parkersburg, W. Va., Wright aviators.

Sept. 12—Syracuse, N. Y., State Fair. J. A. D. McCurdy (Curtiss).

Sept. 12-16—Milwaukee, Wis., one Wright machine.

Sept. — —Flights at Mexico City.

Sept. 12-17—Rock Island, Ill., State Fair. J. C. Mars (Curtiss).

Sept. 17—Indianapolis, Ind., elimination race to select representatives in Gordon Bennett balloon race.

Sept. 19-24—Detroit, Mich., Wright aviators.

Sept. 21—Olean, N. Y., State Fair, flights by McCurdy (Curtiss).

Sept. 22-28—Knoxville, Tenn., Wright aviators.

Sept. 26-30—Trenton, N. J., Wright aviators.

Sept. 27-30—Rochester, N. Y., Wright aviators.

Sept. 26-Oct. 1—Helena Mont., State Fair, J. C. Mars.

Oct. 1-8—Springfield, Ill., Wright aviators.

Oct. 1-7—Sedalia, Mo., Wright aviators.

Oct. 3-8—Spokane, Wash., State Fair, J. C. Mars.

Oct. 15-23—Belmont Park, L. I., aviation meet of A. C. A., including Gordon Bennett aviation race, latter on Oct. 23.

Oct. 17—St. Louis, Mo., Gordon Bennett balloon race.

Oct. ——St. Louis, Mo., aviation meet.

Oct. 22-Nov. 5—Philadelphia, Pa., aero show of Penn. A. C.

Nov. 17-24—St. Louis, Mo., aero show, Coliseum.

Dec. 1-8—Aero show of A. C. of Illinois.

Simple Conditions for N. Y.-St. Louis Prize.

Official announcement of the stringless prize of the New York *World* and the St. Louis *Post-Dispatch* has been made, and follows:

The New York *World* and the St. Louis *Post-Dispatch* will give $30,000 to the first aviator who, between Aug. 15, 1910, and Jan. 1, 1911, flies from New York to St. Louis or from St. Louis to New York within 100 consecutive hours, using the same aeroplane from start to finish.

The only condition attached to this offer is that at least three days' notice of intention to start for this prize must be given to either the New York *World* or the St. Louis *Post-Dispatch*, in order that announcement may be made of the actual starting and finishing points, the approximate route and other details as agreed upon.

Book Note.

Aerial Locomotion, by F. H. Wenham, and *Aerial Navigation*, by Sir George Cayley, are the first two of the "Aeronautical Classics" which have been gotten out by the British Aeronautical Society under the editorship of Messrs. T. O'B. Hubbard and J. H. Ledeboer. The other four of the set will be published during the year. These cost but a shilling each, and may be had from King, Sell & Olding, 27 Chancery Lane, W. C., London.

AT THE MINEOLA AVIATION GROUNDS

NEW CURTISS AEROPLANE

Willard Carries Three Passengers

THE NEW BALDWIN

Walden Accident

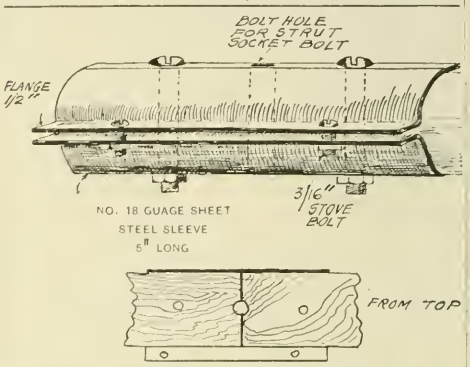
THE new Curtiss biplane, built especially to specifications of Charles F. Willard, the assembling of which was completed at the Aeronautical Society's shed at Mineola, L. I., the 11th of August, differs from the standard Curtiss machine only in size and minor details of construction. The accompanying drawing gives complete measurements:

Main Planes.—These are 32 ft. spread by 5 ft. fore and aft, spaced 5 ft. apart. The other Curtiss machines spread 26 ft. 3 in. by 4½ ft. the other way. The main cell is divided into five sections for shipping purposes. These sections of the lateral beams join as shown in the following sketch: The curve of the ribs is 1 in 20, the deepest point 3 in., coming 18 in. back from the front edge. The Baldwin rubberized linen covering, placed on top of the ribs, is made in panels 5 ft. by 6 ft. (5 ft. by 8 ft. in the center panel) and laced to the large ribs (which come at strut points) through holes therein. The cloth is tacked on top of the intervening smaller ribs with large-headed brass tacks through a strip of black tape. The whole main cell is stayed in the usual manner with Roebling "aviator" cable. All ribs, even in the ailerons and rudders, are laminated ash and spruce. The spruce lateral beams of the main planes are solid. All ribs and beams of rudders and ailerons laminated ash and spruce.

Rudders and Other Surfaces.—There is the usual double plane horizontal rudder, or "elevator," in front, spreading 7 ft. by 27 in. by 27 in. The surfaces of this are double—i. e., the cloth is on both sides of the ribs. The same is true of the vertical rudder in the rear, 3 ft. high by 30 in. the other way; and the fixed horizontal plane in the rear, measuring 7 ft. by 30 in. The latter has a slight curve, the depth of which is ¾ in. at a point one-third back. The elevator has the same curve running back from the front edge, but is cut off at 27 in.

Stability.—This is secured by ample-sized "ailerons," 10 ft. spread by 2 ft. 9 in. length. Instead of having the customary two wires (L), top and bottom, running to one point, joining, and thence over the pulleys to the shoulder brace, double-sheave aluminum pulleys are used and both wires run around the sheaves and then join, giving additional strength.

The control cables from the ailerons run through pulleys on top of the lower plane and under the upper plane to the hinged steel tube back of shoulder brace. Leaning to the high side of the machine when it tilts pulls the aileron on the low side down (and on the high side up), increasing the lift on the low and decreasing it on the high.



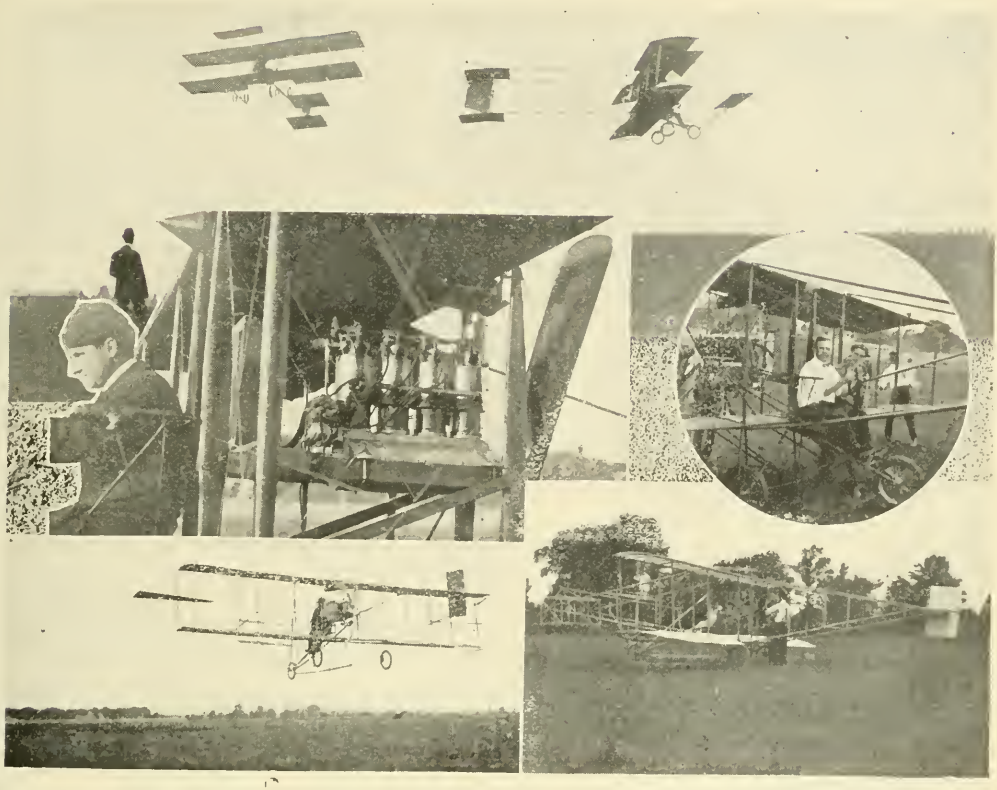
Beam Connection

Steering.—Steering up or down is by the usual movable column; pushing forward steers down, and pulling back steers up. A bamboo rod runs from the column to a short mast at the front edge of the elevator for this purpose. The vertical rudder control cables run over pulleys at the end of the

Photo by Joseph Burt, Mineola, L. I.

Chas. F. Willard in first flight with big Curtiss machine. The inserted picture is a close view of same.

Photo by Joseph Burt, Mineola, L. I.



Harmon in His Farman.
Russell in a Curtiss with Harriman Engine.
Seymour Flying His Curtiss.

Capt. Baldwin in Flight.
Baldwin Close Up.
Curtiss Copy of G. E. DeLong of the Elbridge Co.

bamboo outriggers and through the lower ones to pulleys at the bottom end of the aluminum steering column or pillar, up through the inside of same, crossing, and twice around a groove in the wheel. Turning the wheel left or right, as in an automobile, steers the machine accordingly.

Power Plant.—A Curtiss eight-cylinder, rated (A. L. A. M.) 51.2 h. p., "V" water-cooled engine drives direct a 7-ft. Curtiss propeller. Heretofore all of Willard's flights have been made with the four-cylinder 25-30 motor. The cylindrical gasoline tank is placed in front of the engine on the same bed, as is the extra large El Arco radiator, which is just behind the front struts at the back of the operator. Under the engine is suspended, by steel tubes from the engine bed, the oil tank, the oil feeding up by a small pump. A float has been arranged in both oil and gasoline tanks and gauges to show the level of supply are placed convenient for the aviator's sight. On the side of the steering column is a throttle lever connected by Bowden wire system to the carburetor. At the left foot is also an accelerator, connected to the above Bowden wire at a point on the inclined beam where the steering column hinges. A Bosch magneto, with set spark, furnishes ignition. The brake on the front wheel is operated by the right foot and at the same time short circuits the magneto.

Details of construction are shown clearly in the drawing and sketches. The weight of the machine is estimated at 650 pounds. Where several cables come to a common point, linen cords are tied from one to the other (see sketch) to prevent their catching, say, in the propeller in case of breakage, which generally comes near the sockets. This habit has saved many propellers in Willard's experience of a year.

Aug. 12.—The first flight, of 7 minutes, was successfully made over the Hempstead Plains last evening.

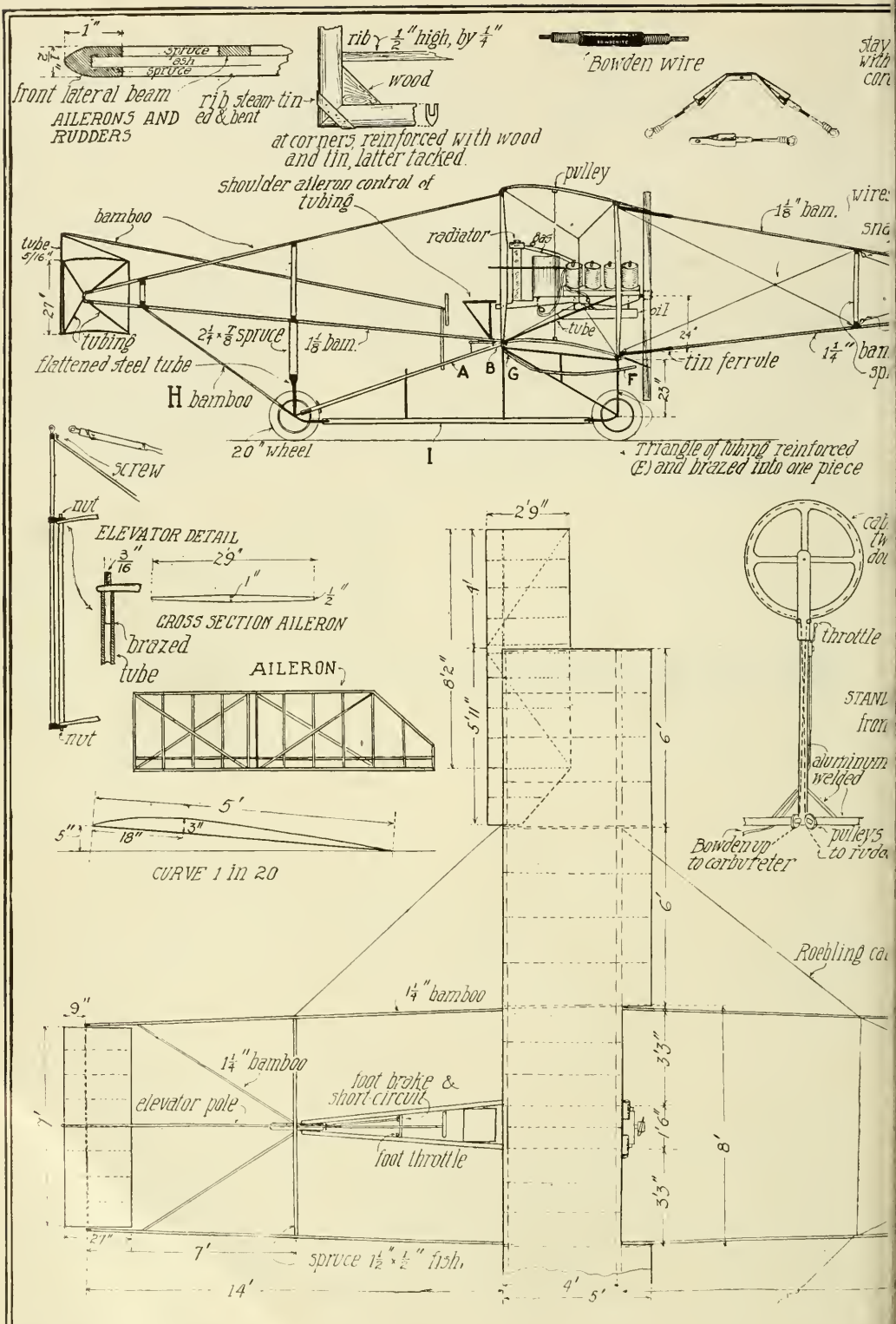
Willard Carries Three Passengers—United States Record.

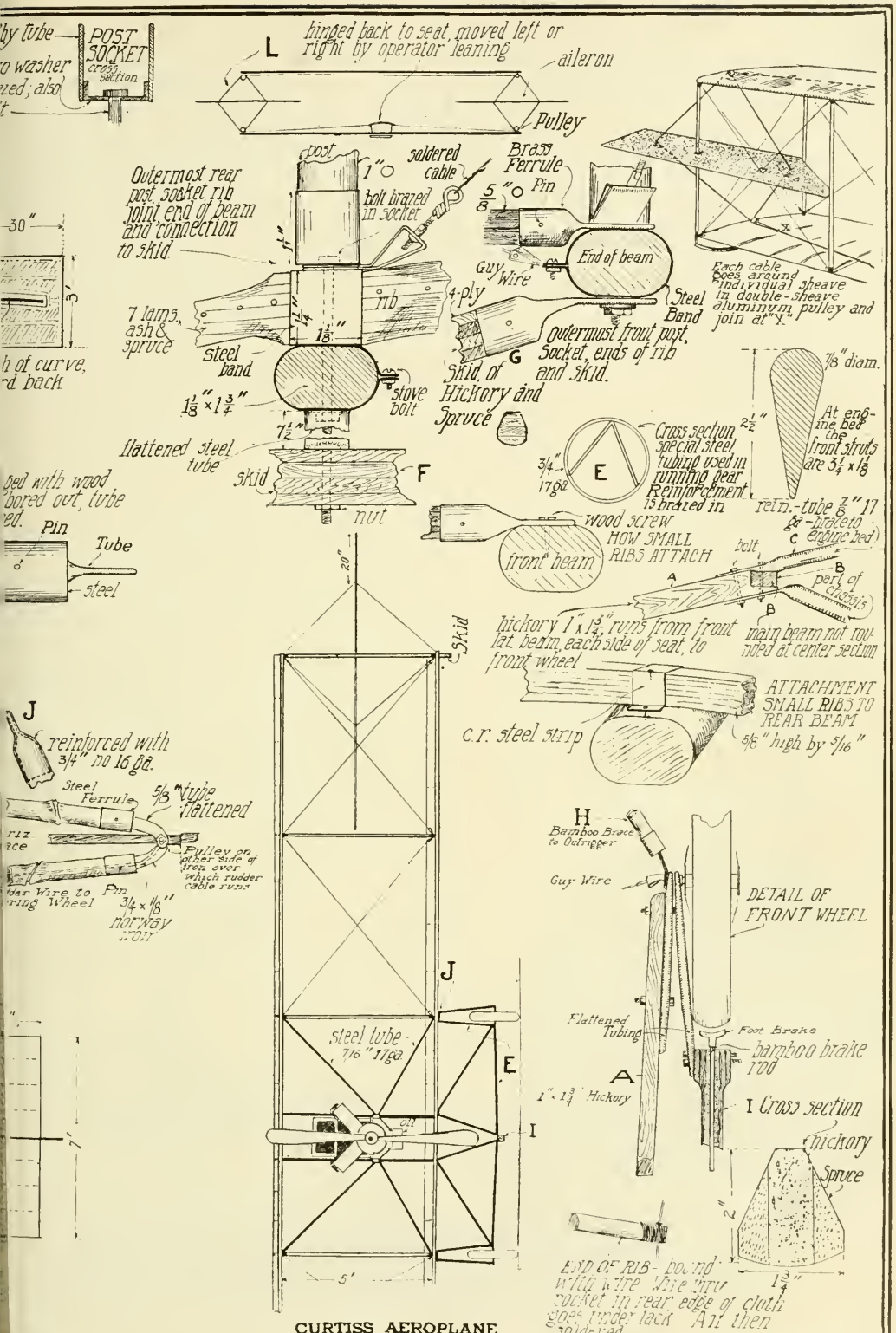
Mineola, Aug. 14.—Charles F. Willard to-day established an American record for passenger carrying at the Mineola field when he took up with him R. F. Patterson, Harry Willard and A. Albin. Starting from the Aeronautical Society's shed, he flew at about 15 ft. above the ground as far as the grandstand, a distance of a quarter mile. The machine, a Curtiss of larger size than usual (described in this issue), had only been assembled two days before and made its initial flights. The four men weighed 375 lbs., the machine is estimated at 650, and with the balance in gas and oil, made up about 1,200 lbs. total for 320 sq. ft. of supporting surface. Other flights were made by Willard alone. The day before several flights were made, one of 12 miles across country, and he carried two passengers on one trip, J. C. Mars and his brother, Harry Willard.

HARMON FLIES OVER HOUR.

Clifford B. Harmon flew for 1 hr. 1 min. on this day, the longest flight that has been made at the grounds for the past month. J. J. Frisbie made his first attempt at flight in his finely built Curtiss copy, equipped with an Elbridge-40 engine. He was flying nicely, when he turned the elevator up

(Continued on page 96.)


1"
spruce
ash
spruce
front lateral beam
AILERONS AND RUDDERS
rib steam-tinned & bent
rib ½" high, by ¼"
wood
at corners reinforced with wood and tin, latter tacked
Bowden wire
stay with
shoulder aileron control of tubing
pulley
bamboo
tube 5/16"
radiator
oil
tube
1⅛" bam.
wire
tubing
2¼ x ⅞ spruce
1⅛ bam.
flattened steel tube
H bamboo
A B G F
tin ferrule
1¼" bam.
20" wheel
I
Triangle of tubing reinforced (E) and brazed into one piece
screw
nut
ELEVATOR DETAIL
3/16"
29"
1"
½"
CROSS SECTION AILERON
brazed tube
AILERON
nut
2'9"
4'
8'2"
5'11"
6'
6'
5'
5"
18"
3"
CURVE 1 in 20
throttle
aluminum welded
Bowden to carburetor
pulleys to rudder
Roebling
1¼" bamboo
9"
1¼" bamboo
elevator pole
foot brake & short-circuit
foot throttle
3'3"
1'6"
3'3"
8'
21"
7'
spruce 1½" x ½" fish
14'
4'
5'



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too quickly and shot up to 50 ft. In landing hard he broke a rear wheel. By reason of lack of space the description of his machine is held over for another month. A feature of the Frisbie machine is the two El Arco radiators, placed on either side of the operator. This is the first time that two radiators have been used.

Philip W. Wilcox also made his debut in his Farman-type biplane with a Rinck 50 h. p. engine. He circled the field at a height of 25 to 100 ft., and the machine appeared the most stable of any on the grounds. The machine was tried out twice before, by Lewis Strang and by Hamilton, but each time the running gear gave way. Full details will appear later. G. E. De Long, treasurer of the Elbridge company, had a slight accident, breaking a wheel, in his first trials on this day. W. L. Fairchild has received an Emerson engine and will shortly begin trials with his monoplane.

The Capt. Baldwin Biplane.

Captain Thomas S. Baldwin has made some changes in his biplane which he has been flying at Mineola for some time. The Curtiss 4-cylinder engine has been replaced by one of 8 cylinders with an A. L. A. M. rating of 51.2 h. p., though 61 h. p. has been claimed for a similar engine. The Curtiss propeller has been replaced by a Requa-Gibson driven direct. The engine, of course, has been placed higher up instead of being situated as formerly on the lower plane and driving by chain. Formerly the propeller was ahead of the main planes and the aviator sat on a level with and just back of the lower plane, as illustrated in the May number. The vertical stability surface above the upper plane has been left off temporarily, Capt. Baldwin still believing in its possibilities.

Though larger in spread than the planes of the Curtiss machines, the ribs are standard Curtiss. The surfaces are single Baldwin rubberized silk, laced to the main ribs, and tacked to the front lateral beam. A wire runs through a pocket in the cloth to form the rear edge. The spruce lateral beams are 1¾ by 1¼, flat with half-round edges, which makes the cross section nearly elliptical. The struts are 2¼ in. by 1 in. fish-shaped of spruce. These narrow down to 1 in. round where they fit in the sockets. Roebling wire cable 1/16th diam. is used to stay the main cell, as well the forward and rear construction. In place of the two rear center struts steel tubing is used and to these the horizontal beams forming the engine bed are bolted. Diagonal steel tubing braces are also used at this point. The two front center uprights are 3½ in. by 1 in.

The front horizontal rudder, single surface, with a curvature of 1 in. in 32, is stayed by wire cable from 18-in. masts, one on each side. The frame of the rudder is covered both sides with cloth, tacked to the ribs. The ribs in the rear cell, or tail are covered both sides with cloth.

The rear three feet of the tail cell is so arranged that the angle of incidence may be changed by tightening one set of guy wires and loosening the others. This part is hinged on the front eighteen inches which remain stationary. The control of the ailerons is by a shoulder brace, and the rudder by turning a wheel, similar to the system employed by Curtiss. All wires running to the rudder and controls instead of passing over pulleys are run through copper tubes, bent to the required curvature, as described some time ago in AERONAUTICS. The weight is around 670 lbs.

The equipment includes Palmer tires, Bosch magneto, and El Arco radiator.

Dr. H. W. Walden's Monoplane.

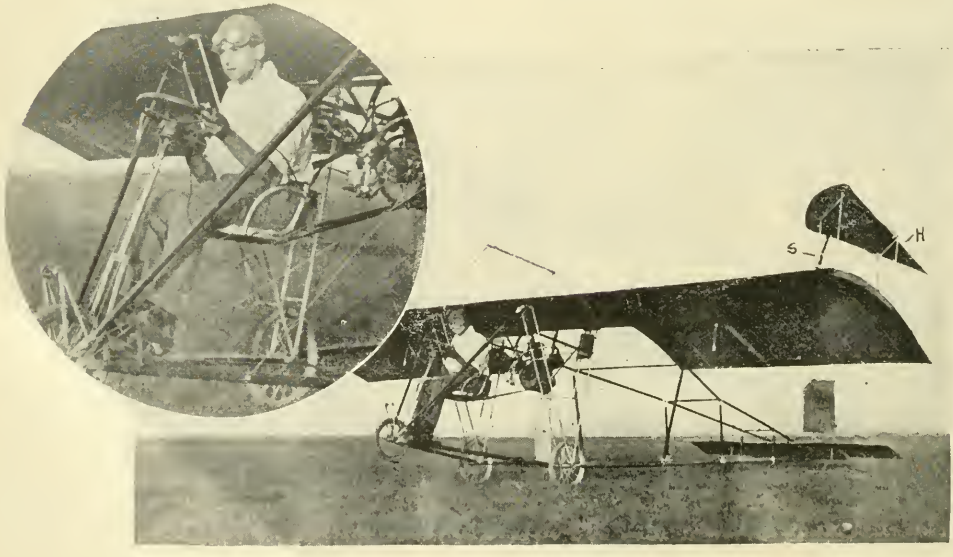
Dr. H. W. Walden gave his monoplane—the third machine he has built—its first trial on Aug. 3-7, with disastrous results. In just one short initial try three ribs and one collar-bone were broken. And then, to make matters worse, a none-too-kind female nurse at the local hospital insisted on plucking from his lips with unneedful force, a consoling cigar which had been given him at his request just after the accident. Then he lapsed into unconsciousness, which may or may not have been a direct result. Then, again, it was found the hospital was shy of bandages, all having been used up on the previous aviator.

In this first attempt the machine got off the ground all right and the new stability device seemed to work perfectly. The lateral beam of tubular steel on which rotate the two elevators was too weak and bent up, shooting the nose of the aeroplane quickly down, so that the aeroplane struck on its front wheel, with the tail vertically in the air, the front lateral beam pinning Dr. Walden to the ground.

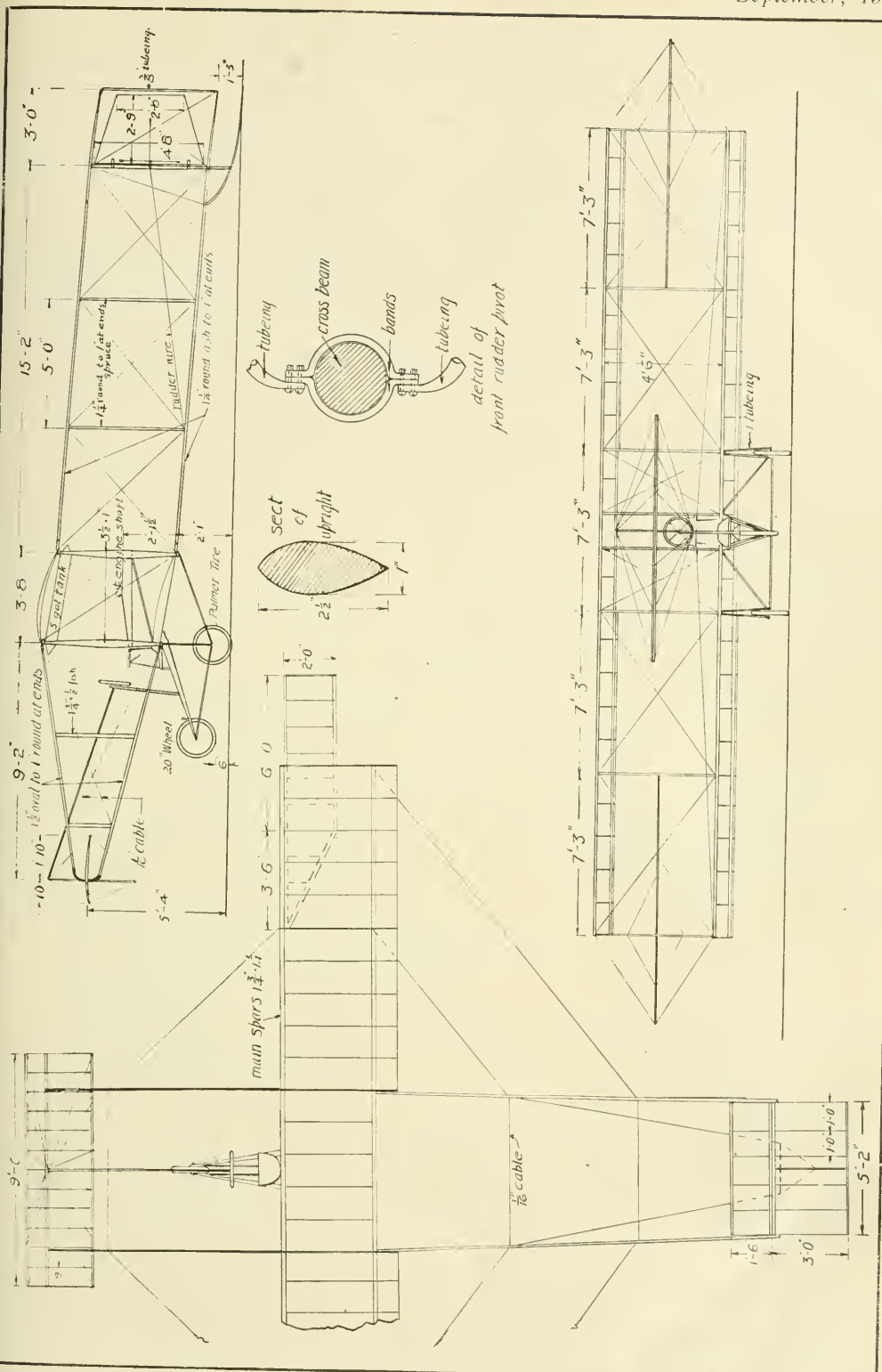
DESCRIPTION OF THE MACHINE.

The *main supporting plane* spreads 26 ft. by 7 ft. in depth, and contains, allowing for the portion cut away for the propeller, 165 sq. ft. The lateral beams, of spruce, are in five sections, joined

(*Continued on page 98.*)



Dr. Walden and His Monoplane



Capt. Baldwin's Machine

together by sleeves of steel tubes. The ribs are of "I" cross section, the horizontal strips ⅞ in. wide, the whole rib tapering front and rear from 3 in. at greatest height. The vertical part of the rib is bored full of holes throughout its length. The strips on top and bottom are screwed and glued on. The ribs follow a parabolic curve from the front beam to the rear edge. For 9 in. forward from the front lateral beam the surface narrows to a point. The greatest depth of the curve is 4¾ in. at a point one-third back from front edge.

Tail Plane and Elevator.—At the rear is a fixed surface of 15 sq. ft., with a movable section at either lateral extremity, both totaling another 15 sq. ft. These are curved in the same ratio as the main plane. These latter pivot about a lateral steel tube one-third back from forward edge. From a short mast running through each of these wires run along the "fuselage" and over the pulleys over the front wheel and fasten to the steering column. Pushing forward on the steering column steers down, and vice versa. All surfaces are covered both sides with Naiad linen.

Rudder.—The vertical rudder has a surface of 7½ sq. ft., and is operated by turning the steering wheel left or right.

Stability.—A new scheme for automatic lateral stability has been devised and patented. This consists of small planes inclined at an angle of about 45 degrees, placed on a rectangular frame on top at the extremities of the main surface. Each small plane is hinged near (H) its rear and near the forward end is a spring (S). If the machine starts to slide to one side or the other, the increased pressure is designed to cause the front end of the little plane to raise up against the spring's pull and present a greater angle to the wind. The spring holds the plane normally edge into the wind. This is illustrated herewith.

Power Plant.—An Anzani three-cylinder air-cooled motor of 25-30 French h. p., mounted or hung in a frame of tubing, placed below the rear lateral beam, drives direct a 6-ft. propeller. One of those used was a Requa-Gibson of 4-ft. pitch, and the other a Brauner of 4-ft. 3-in. pitch. There is no throttle to regulate the G. & A. carburetor, but a lever on the engine is utilized to lift the valves, permitting, when occasion demands, the propeller to turn perfectly free, with no explosion taking place. The moment the lever is let down again, the motor starts its usual work. This compression release is operated by the left foot. On the steering wheel is a spark cutout. The spark advance is on a right-foot pedal. Coil and battery ignition.

Chassis.—The running gear has for diagonal struts steel tubing pinned and brazed in sockets. The horizontal members connecting the hubs of the three wheels are of spruce. The axle of the two rear wheels is of angle steel.

The wheels are of Weaver make, 20 in. rear and 16 in. front, fitted with Hartford aviator tires

The *fuselage* is made up of spruce, with steel sockets, stayed with piano wire. In the next machine, which is to be finished by Sept. 1, this will be built of ash and stayed with Roebling aviator cord. The aviator's seat is suspended by piano wire.

The Month Past at Mineola.

Nearly every day during the past month flights have been made by Harmon, Baldwin, Russell and Joe Seymour. J. J. Frisbie on two Sundays made hot air balloon ascents and parachute drops.

MANY MACHINES ON THE GROUND.

Dr. William Greene will soon have one of his biplanes down at the Aeronautical Society's shed for flights.

The machines in the Aero Club sheds are: Clifford B. Harmon (Farman), Capt. T. S. Baldwin (Baldwin), W. L. Fairchild (own monoplane, building), H. S. Harkness (Antoinette), and Philip W. Wilcox (Farman-type). At the Aeronautical Society sheds are: Miss E. L. Todd (biplane, not yet tried), W. Diefenbach (making), Frank Van Anden's light Farman-type with Harriman engine, Geo. Godley (imitation Curtiss, making), Dr. H. W. Walden (monoplane with Anzani motor, recently damaged at trial), M. P. Talmage (making Curtiss-type), G. E. De Long (Shneider make of Curtiss type, with Elbridge engine), Jas. Murgatroyd (biplane own design, with two Adams-Farwell motors operating individual propellers, not yet tried), George Russell (one Curtiss with Harriman engine and one copy, former making almost daily flights), Elmer Burlingame (own design monoplane, Harriman engine, not yet tried), Louis Rosenbaum (monoplane, owner's design, not yet finished), Edwards & Edick (small copy of Curtiss, well built, own make of engine), Paul Kilduchevsky (monoplane, owner's design, making).

The Society has added an extension 30 by 138 ft. to its already large shed to accommodate some of the machines which have been housed under tents.

AVIATORS SHARE PROFITS IN GATE RECEIPTS.

Some time ago the owners, a real estate concern, of the lands over which the flights are made, built a fence on three sides and began charging the public admission to a grandstand and the field. On Aug. 13 there was established a system of "points," each machine making an appearance on the field earning 1 point, a short jump a certain number, length of flight is rewarded, etc. The aviators share in profits according to the points earned. The two aeronautical organizations have nothing to do with the financial end of the enterprise, merely leasing shed ground and privilege of flight over the other lands. Each Saturday and Sunday large crowds view the flights of Harmon, Baldwin, Russell, Seymour, etc. Mr. Harmon objects to accepting money prizes and takes a cup or trophy instead.

PATENT LIST

Theodore Kornbrodt, Chicago, Ill., 962,964, June 28, 1910, filed Oct. 28, 1909. AIRSHIP. A dirigible balloon having an elongated air bag semi-circular in form which is inflated with heated air from the exhaust pipes of several engines. A plurality of propellers provide the motive force while the steering is performed by a "resident element" acted upon by an air blast from a tube at each end of which propellers are arranged.

August Richard Rieger, Chicago, Ill., 962,977, June 28, 1910, filed Sept. 9, 1909. AIRSHIP. A chassis of tubular form on wheels, provided with a motor operating a propeller at the front which is adjustable as to the plane of rotation. Reciprocating wings extend at each side and in addition gas containing cylinders are provided at each side to sustain a portion of the weight. The cylinders are movable back and forth to maintain equilibrium.

Thomas Mortimer Crepar, Fargo, N. D., 963,522, July 5, 1910, filed June 2, 1908. FLYING MACHINE, the main characteristics of which are a plane of corrugated form, instead of the usual flat surface, pointed at the front and diversing outwardly and down at the sides. A series of vanes are disposed on the plane adapted to be moved simultaneously at various angles and a spiral propeller supplies the motive force.

Harold M. Chase, and Minor F. H. Gouverneur, Wilmington, N. C., 963,516, July 5, 1910, filed March 17, 1910. STABILIZING MEANS FOR AEROPLANES. A biplane provided with vertically arranged partitions located between the planes extending longitudinally of the machine. The rear portions of said partitions are movable manually.

Gerald Geraldson, Newcastle, Cal., 963,543, July 5, 1910, filed May 14, 1909. AEROPLANE formed by stretching material over a continuous rim which may be elliptical in shape. A transverse rod passing substantially through the center of the ellipse secured at each end to the rim, serve as the supporting means by pivotal connections to standards rising from the car. Means are provided for changing the angle of the plane and also the standards relatively to the car.

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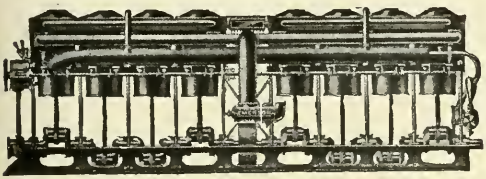

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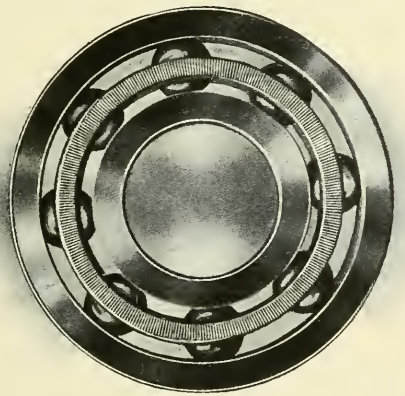

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¶ At the Meet of the West Hudson Aero Club at Arlington, N. J., June, 1909, New York papers said, "The hundreds of kites in the air were a decided feature."

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FLIGHT PROGRESS OVER THE COUNTRY

Flights With Burgess Aeroplane.

William Hilliard has been making a constant succession of flights with one of the Burgess Co. & Curtiss machines at Plum Island, Mass., having flown on one day alone 25 times without breaking even a rib or skid. The company's energies are being devoted to the Model C "Flying Fish" which is to have wheels as well as skids and to be driven by a Clement-Bayard 30 h. p. motor. The company has hitherto employed two different types of propellers designed by A. M. Herring, two designed by Mr. Pfitzner and two Chauviere. A new propeller is being developed to have the good points of these without the defects. This will be of the 2-bladed type with uniform pitch and as symmetrical as the highest efficiency will permit. The general design will be adapted to different diameters, the standard diameter for light machines being 6½ ft. The Pfitzner monoplane, now the property of the company, is at Garden City for sale at $4,000, with a Curtiss 4-cylinder engine.

The control device is novel in the "Harvard I." There are two elevators in front, each operated by separate levers at the right and left hand of the aviator. In ascending or descending, both are moved to the same extent, but one or the other is moved individually to maintain lateral equilibrium. The levers lock automatically on being released. The vertical rudder is regulated by the operator's foot. The motor and direct-connected propeller is swung in a revolving cradle, with the axis of support passing through both the center of gravity and the line of thrust of the motor. By a simple movement of either hand or foot the operator can adjust the thrust angle at will. The device is self-locking and free from vibration. The norm of the line of thrust passes through the aeroplane's center of pressure. Detachable wheels equipped with spring shock absorbers are attached to the skids.

The "Harvard I" was designed, patented and flown by James V. Martin, manager of the society.

Navigates Over New York.

Thousands of residents of the village of Manhattan were startled on the evening of July 19 when Frank Goodale operated his dirigible balloon from Palisade Park across the Hudson to Broadway and then down around the *Times* building and return. The distance is about 10 miles.

Harvard Biplane Flies.

The Harvard Aeronautical Society, numbering 400 members, lays claim to having the lightest biplane in the world, its weight being but 165 pounds, including wheels, but without engine.

The riding surface is 200 sq. ft. and the control surface 35 sq. ft. Equipped with disappearing wheels and offset surfaces, it is constructed of hollowed and laminated air-dried spruce without bolts, screws or nails. The after cross-piece is on top of ribs, while the fabric is underneath the ribs.

The machine, which was built by S. L. Saunders and certain Harvard students, has made several 125-yard flights within Soldiers' Field, fitted with a regular Cameron 4-cylinder, air-cooled automobile engine, at a height of 8 or 10 ft. However, the engine was not developing more than two-thirds of its horsepower and weighed with equipment 250 pounds. The engine itself weighed 196 pounds. The propeller was a Herring four-bladed, giving 200 pounds thrust at 1,200 r. p. m.

Trans-Atlantic Airship Ready Soon.

The Wellman polar airship, "America," is being assembled at Atlantic City, N. J., and before long trial ascents will be made. Previous to the cross-ocean attempt the ship will be navigated to Philadelphia and New York, it is promised.

Flight up York State.

Bath, N. Y., Aug. 16.—Fred Eells, who has been making several short flights in the Kirkham-Eells biplane here for the last week, this morning made a flight of one and one-half miles at a height of 75 ft., making a complete circle and returning to starting point. The machine is a biplane with a new system of control and is equipped with a 25-30 horse-power 4-cylinder Kirkham aero motor. A complete description will appear next month.

The **Nashville Aero Club** seems to be another "fly-by-night" club, as letters addressed to it as well as individual officers are returned by the post office. A chance for the national council of the Aero Club of America to do some work. An exhibition was recently held in Nashville.

IN THE AERIAL MARKET PLACE

TO OUR FRIENDS — We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

Detroit Aero. Construction Co. Motor.

The Detroit Aeronautic Construction Co. of Detroit, Mich., realizing some time ago that the present type of automobile or marine motor was entirely too large, heavy and cumbersome for aviation work, set about to build the smallest, lightest and most effective power plant which could possibly be constructed. Its 30-40 h. p. motor weighs well inside of 175 pounds, including a double ignition system, carburetor and propeller.

In order to secure efficient service, ball bearings are used wherever the same are at all practicable or applicable.

With the exception of the cylinders, pistons and crank shafts, the entire motor is built of aluminum, including the Schebler carburetor, which is being made especially for this motor, thus reducing the motor to the very minimum of weight without sacrificing strength in any way.

The company has no hesitancy in saying that, in so far as size is concerned, it is building the most compact motor, for the power developed, in the world, the 30-40 h. p. motor occupying but about 18 by 19 in. of space over all.

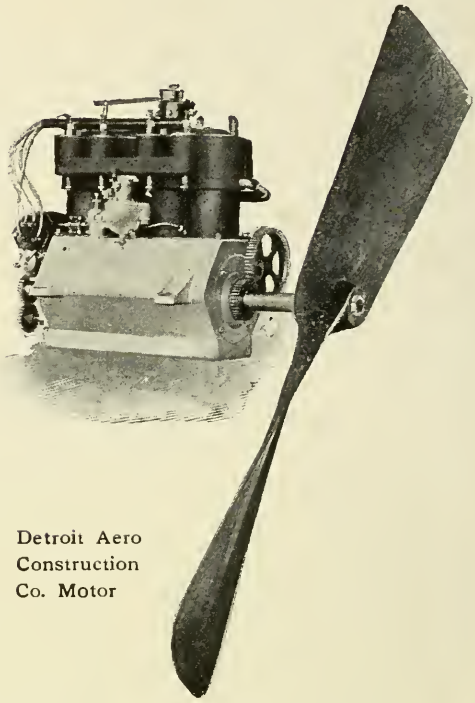
The cylinders on all motors are cast *en bloc*. The crank shafts are cut out of solid blocks of chrome nickel steel, and are carried on two large Hess-Bright ball bearings. All rotary parts are thoroughly balanced and in every way made as light as possible, without sacrificing strength for lightness. The intake, as well as the exhaust valves, are made especially large, to insure perfect intake of fuel, as well as absolute scavenging of cylinders. In the construction of the intake valves and manifold, the company has gotten away from the adopted form, and has adopted a system of its own, which is unique in so far as compactness and simplicity are concerned. The exhaust is effected by a peculiar cam operation, giving an easy rotary movement, combined with quick action, and is "fool-proof."

The company has also gotten away from the ordinary in its oiling system, which consists of a very small rotary gear pump built in the crank case, so as to be easily accessible in case a repair should be necessary. This forces the oil to all cylinder and connecting-rod bearings. The oil being pumped from a sub-base to the cylinders and to the crank case makes a splash system, a lever overflow pipe to the sub-base taking care of all excess oil.

Years of experience in building motors for racing boats has taught the company that in order to secure absolute ignition its motor must be equipped with a double ignition system. This system consists of a Bosch magneto and of a primary and secondary distributer with a single coil, and it is the claim of the company that it has the only perfect ignition system in present use.

The company states: "That the motors built by this company are a success is proven by the many orders which it has received from persons who have spent much time and money in experimenting with other motors, and who have discarded the same for the Detroit motor, and have found perfect success with it. References as to successful users of this motor will be gladly furnished by the company on application."

The company is now making arrangements for the building of a larger factory, in order to enable it to take care of its rapidly increasing business. Orders for more of the latest improved machines have already been placed, and negotiations for the building are now in progress. The company is always glad to see prospective customers and have them examine the plant and the motor. All motors are furnished with either aluminum flywheels or laminated wood propellers.



Detroit Aero Construction Co. Motor

Hall-Scott Aeronautical Motor.

Two types of aerial motors of light weight are offered by the Hall-Scott Motor Car Co. of San Francisco, Cal., this concern having already delivered a number of them to western aviators.

One of the interesting facts about the successful flight of the Wiseman-Peters aeroplane at Petaluma was the use of a Hall-Scott eight-cylinder, 60 h. p. motor. Al Hall, the designer, is best known as an automobile man, being well known locally as the builder of the Comet automobile, which made all kinds of records on local California tracks for two seasons.

These engines are both of the four-cycle type, water-cooled: a four-cylinder, 30 h. p. and an eight-cylinder 60 h. p., both having cylinders measuring 4 in. bore and 4 in. stroke, and with the exception of the crank shaft and crank cases all the parts on both types of motors being interchangeable.

The cylinder walls, pistons and heads are made of a special cast iron. The valves, of nickel steel, are seated directly in the removable heads and operated by push rods and rocker arms. The water jackets are of spun copper, a by-pass between the jacket and cylinder head being used as a preventative of any leakage into the cylinders.

The cam shafts are located in the crank cases, which are of the strongest known aluminum alloy. The crank shafts and connecting rods are machined from hand forgings of a low carbon machine steel, which it is claimed is best adapted to use where a propeller is employed, bored and milled and ground accurately to size. Main and connecting rod bearings are of larger size than ordinarily used, being 1¾ in. in diameter.

The crank cases are split, the bottom oil cases having an oil reservoir cast integral, from which

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a 26-foot span

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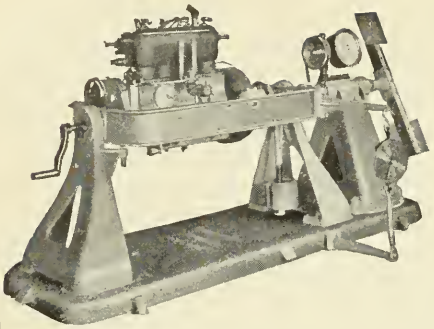

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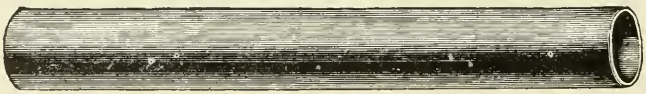

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Many eminent engineers and physicists believe it to be attainable by man. We know that it is performed by the birds. Read the article entitled "SOARING FLIGHT," by OCTAVE CHANUTE, in the EPITOME OF THE AERONAUTICAL ANNUAL. This EPITOME contains also articles by CAYLEY, WENHAM, LILIENTHAL, MAXIM, LANGLEY and others who laid the foundations of the science of aviation. 224 pages, 18 plates. Price $1.00; postage 12 cents. W. B. CLARKE CO., 26 Tremont St., BOSTON.

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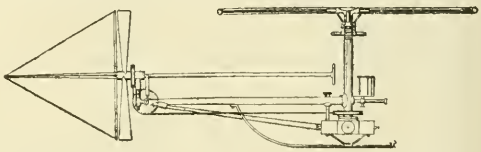
As Willie dove to Death and Hell--
Thou hast my choicest model ta'en—
How shall I see to make a Fool again?"



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JOS. E. BISSELL, Box 795, Pittsburg, Pa.

a gear pump draws and keeps the oil in continuous circulation, constant level splash system of lubrication being used.

A ball-bearing thrust collar, integral with crank case end, is arranged to take a thrust in either direction, so that a push or pull propeller may be used.

Ignition is by Bosch high-tension magneto, and a special aluminum Stromberg carburetor is regular equipment.

This company claims simplicity of construction and design, with as much lightness for the power developed as any other water-cooled motor that will stand up under the hard usage that an aeronautical motor has to contend with.

In addition to these motors this concern offers laminated elm and mahogany propellers, which they believe have original lines, and which they claim give more thrust for the horsepower expended than propellers of other manufacture. Using a 6-ft. blade on their 30 h. p. motor, they claim a thrust of 220 pounds at 1,100 revolutions, and with an 8-ft. blade and their 60 h. p. motor a thrust of from 330 to 390 pounds at 1,200 revolutions.

They are also prepared to furnish radiators of light weight, but with liberal cooling surface, in two types, a 30 h. p. weighing 14 pounds and a 60 h. p. weighing 30 pounds.

The Detroit Rotary Motor.

The Michigan Airship Co. has been formed in Detroit, Mich., to make and distribute a new rotary engine, called the "Rotaero." It is claimed by the makers that in this motor many of the aims of the engine designer, great power with little weight, long life, simplicity, accessibility, freedom from repairs, etc., have been accomplished.

DESCRIPTION BY FREDERICK WEINBURG.

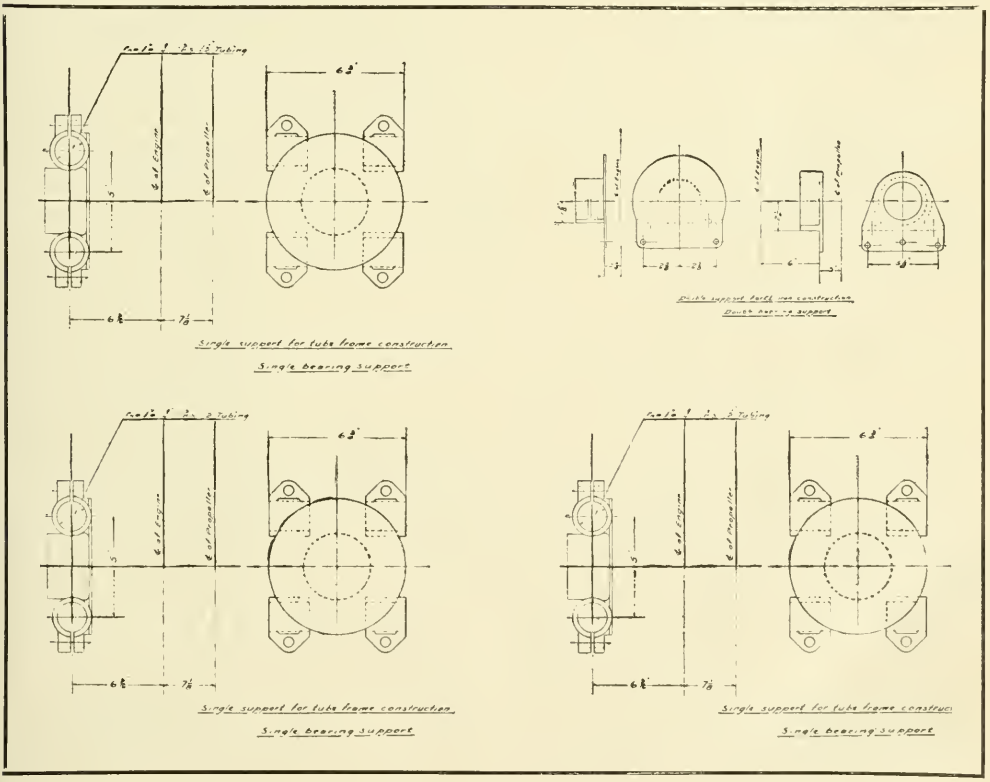
The engine is a 1-cylinder in principle, which has been divided into two perfectly balanced units, and the different working phases of the cycle, as charging, compressing, explosion and expansion, occur in both units exactly at the same time but in opposite directions. This relieves the center of the engine from any bending strain under normal conditions.

Adverse criticisms have been made against the multiple type of rotary engine for the simple reason that it requires a man of thorough technical knowledge to locate ignition troubles. In the revolving 1-cylinder type the difficulty of locating the ignition troubles of the multiple cylinder rotary type is being eliminated, as both sparks must occur simultaneously in the same place, which is not the case in a multiple cylinder type of engine.

This engine has been designed in accordance with the 2-cycle principle, because a 2-cycle engine gives more power for a given weight than the 4-cycle, and eliminates in the present design the intake valves entirely, and simplifies the electrical or mechanical timing arrangement to a great extent.

In the present design the so-called, "straight-line" clearance has been introduced which is even of a greater volumetric efficiency than the 4-cycle principle, inasmuch as there is no non-scavenging space above the piston in which the burnt gases can possibly remain, which is often the case in the imperfectly designed valveless 2-cycle engines. The new charge, by aid of the crank case compression, fills the cylinder through the by-pass on the very lowest point and leaves through the head valves after the expansion stroke, and inasmuch as carburetor intake and exhaust ports are located in a radial direction to each other, the centrifugal force plays a very prominent role in the process of charging and discharging, helping to throw the charge into the crank case, transferring the same from there into the cylinder and after the expansion stroke into the air.

The engine may be mounted hanging from one bearing like the French Gnome motor, or it can



Detroit "Rotaero" Motor

preferably be located between two bearings while the propeller swings outside the front bearing.

The pistons describe a true circle around the wrist pins and form, during a half revolution of the engine, a vacuum in the crank case, drawing the gas and oil mixture through the hollow crank shaft and a mechanically operated poppet valve into the crank case where it is compressed during the next half revolution, then entering the cylinders by means of the by-pass, filling same. A short time before the head of the piston clears the by-pass, the exhaust valve is opened mechanically and the burned gas rushes out, driven by its own pressure, mostly before the piston head reaches the by-pass opening and as the exhaust valve is still open at this moment, the new charge entering the piston gets a chance to assist in driving the remainder of the burnt gas out.

Touching on the constructional side of this new aeronautical power plant, the different parts of the engine are machined to fit within one-thousandth of an inch, and are made on the interchangeable plan through the use of precision instruments and fixtures. The crank case is made of aluminum, and is cast in one piece. Cylinders are made from cast iron machined all over. The pistons from the same grade of cast iron and contains three rings, of which two are above and one below the wristpin. The crank shaft is double throw, and bored out to reduce weight and to admit the gases. The exhaust valve is located in the head of the cylinder and is made from the same grade of cast iron as the latter and is of sufficient area to empty the cylinder in minimum time. The magneto is driven positively at crank shaft speed which insures an easy starting of the engine direct, without the aid of battery ignition. The engine is held together by means of two tension bars terminating at each end in a valve cage retainer in which the valve is seated and held to the cylinder and with the same is held to the crank case. It is natural that the cylinder valves, etc., exert an enormous pressure through the action of the centrifugal force, and keep the valves seated tight. Consequently in this way the cylinder is in compression instead of intention and as the tension bars are of sufficient size to take care of the pressure at a high speed with an ample factor of safety, there is no danger whatever for the parts to become loose or to be thrown off. American-made annular ball bearings have been used as main bearings. The connecting rod bearings are made from best white brass. The lubrication system employed is the spraying system by which the oil is drawn into the crank case in form of a fine spray, oiling in this way all internal working parts. The testing experiments of this engine have not been completed, at the time of going to press. However, arrangements have been made with one of the foremost universities to have this engine tested with the aid of all scientific means, and the results of these tests will be published in a subsequent issue.

Church Aeroplane Co. Busy.

The Church Aeroplane Co. has completed a Bleriot, cross-channel type, for Cohan & Harris, theatrical managers, to be used this fall in the new play, called the "Aviator."

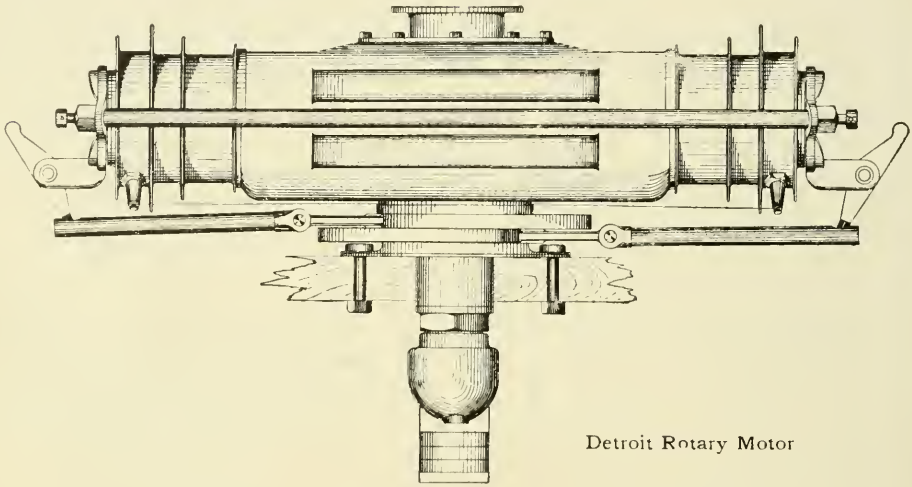
A biplane is also building for Kramer, the former bicycle champion.

The *World* has bought an exact model of the Curtiss Albany-New York flyer, built to scale 2 in. to the foot, and all details are carried out very minutely. Seven of the principal type models have been shipped to Revere Beach. These were built to order for the Suffolk Amusement Co., and are on exhibition in connection with a daily balloon ascension.

The Church company recently moved to new quarters, 123 Smith St., Brooklyn, where there is room enough to build four machines at once.

Rinek Engines Two a Month.

The Rinek Aero Manufacturing Company have now secured the services of a first-class mechanical engineer, Mr. William Francis, and are now in a position to turn out two engines a month. Mr. Francis succeeds J. E. Smith, who is no longer in their employ.



Detroit Rotary Motor

New Books.

Modeles d'Aeroplanes is the title of a recent book on model building. It is well illustrated, with drawings of models, power plants, etc., and there are listed small propellers of various sizes, gasoline motors and rubber-band plants.

Price, 2 francs, from Librairie de l'*Aviation Illustrée*, 5, due Coëtlogon, Paris (VIe), France.

Encyclopedie Aeronautique, by L. Ventou-Duclaux. (Published by F. Louis Vivien, 20 rue Saulnier, Paris. Price, 1 franc 75.) An 8vo brochure containing 300 aeronautical items and terms with definitions and comments. The various machines are concisely described and illustrated and the book is practically an extension of the author's popular "l'Aviation Expliquee."

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WILL last from five to six times as long as a varnished balloon. The weight is always the same, as it does not require further treatment. Heat and cold have no effect on it, and ascensions can be made as well at zero weather as in the summer time. The chemical action of oxygen has not the same detrimental effect on it as it has on a varnished material. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the strength of varnished material. A man can take care of his PROOF balloon, as it requires little or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 lbs. per inch width. Very elastic. Any weight, width, or color. Will not crack. Waterproof. No talcum powder. No revarnishing. The coming balloon material, and which through its superior qualities, and being an absolute gas holder is bound to take the place of varnished material. The man that wants to have the up-to-date balloon, must use VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

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Trade Opportunities in Mexico.

AERONAUTICS' representative in Mexico, Mr. Edward L. Ramsey, Box No. 133, Veracruz, V. C., Mexico, advises that he receives inquiries almost daily from parties in different parts of the Republic, for information as to where aeronautical supplies of all kinds can be obtained, and states that if the manufacturers and dealers will send him catalogues and descriptive matter of engines or samples, of supplies, etc., he will be pleased to forward same to parties making inquiry.

Independent aviators or exhibition companies would do well to address Sr. Don Guillermo de Landa y Escandon, Governor of the Federal District, at Mexico, D. F., Mexico, who is also the President of the National Centennial Committee, with the idea of securing engagements for the Aviation Meet which is being contemplated and which will be held in conjunction with the Centennial Celebration in the City of Mexico during the month of September.

Barberton Aviation Co.

The Barberton Aviation Co., Barberton, O., is offering a modified Curtiss type machine for general sale, equipped with an Elbridge engine, 40-60 h. p. The spread is 37 ft., by 6¼ ft. fore and aft the main planes. The weight complete is about 800 pounds. The equipment includes Bosch magneto and El Arco radiator.

Rubel Company Aero Catalogue.

A most pretentious catalogue having a full line of aero motors and supplies, aeroplanes, etc., is that just gotten out by R. O. Rubel, Jr. & Co., of Louisville, Ky. Nearly everything in the aeronautical line is listed.

Many Engines Sold.

Many sales have been made the past month by engine makers all over the country. The Hall-Scott motor, a new one on the Coast, has already done a promising business. And in this issue will be found some other new motors on the market. The Rinek Aero Manufacturing Co., in Easton, the Harriman and other companies report demands up to the limit of output. Among purchasers of Elbridge engines are John E. Clark of San Francisco, who is building two biplanes; Samuel Barton, 1008 Herkimer St., Brooklyn, N. Y., a 20 h. p., 2 cylinder, for a monoplane; John Seyler, Union Hill, N. J., a 40-60; Glenn Ethridge, Westbury, L. I., 40-60, for a Curtiss type biplane; J. C. Cook, 128 West 125th St., New York, who has a 40-60 for his Curtiss type; George Schmitt, Rutland, Vt., a 40-60, for a Curtiss type being built by Wittemann Brothers.

Nicaraguan to Buy Aeroplanes.

Dr. J. J. de Praslin of Nicaragua has been visiting various aeroplane exhibitions in this country and is now in St. Louis. He became interested there in the Curzon machines, and states that he may possibly buy 12 and remain long enough to become proficient in operation, so as to teach aviators in his own country.

The Curzon manufacturing plant and training school has removed from Chicago to Washington Park, East St. Louis, Ill., where perfectly level grounds are to be had, two miles long by one mile wide, with plenty of surrounding country free of obstructions. A course five miles in length can be flown over.

Chas. C. Bradley, of Pacific Aero Club, has had some interesting results with his large propeller. This laminated propeller is 8 ft. in diameter, with an 8 ft. 3 in. pitch; blade at widest part is 24 in. Turned at about 400 r. p. m. by a 20 horse power 4-cylinder, water cooled motor, 3¾ x 3¾ bore and stroke, the propellor going to 2 of motor, a thrust of 230 pounds was recorded on scale. This propeller is of very neat workmanship and was made by Mr. Bradley personally.

Incorporations.

National Manufacturing & Aerial Exhibition Co.; capital $50,000. Incorporators, Eric R. Mackay, James L. Davis, both of Chicago; Ill.; G. W. Dorsey, Jr., Wilmington, Del.

Detroit Aeroplane Co., Detroit, Mich., $20,000. Curt Weinburg, Fred Weinburg, Ray Wilcox, William Anderson, Alfred Brawn.

The Latendorf Aerial Navigation Co., 34 East 28th St., Bayonne. The authorized capital is $50,000, divided into 1,000 shares of $50 each. The incorporators are Lowell B. M. Hoig, of Orange; G. Edward Menzel, of Maplewood, and Howard W. Forsyth, of Mount Vernon, N. Y.

Chicago Aeronautical Exhibition Co., 2,500; exhibiting airships, aeroplanes, balloons, etc. Charles E. Bartley, Robert T. Laughlin, James E. Gilles.

The Aeronautical Society, New York; promote aeronautics; capital, $10,000. Incorporators Thomas A. Hill, Lee DeForest, Hugo C. Gibson all of New York City.

Stella Aeroplane Co., New York City; manufacture and construct airships heavier than air; capital $50,000. Incorporators, Paul de Kilduchevsky, 316 East 16th St.; David Edelstein, 1605 Prospect Ave.; Isidor Wolfberg, 841 Fox St., all of New York City.

American Aeronautical Association, membership corporation, June 22, 1910. To form organization of representatives of lawfully organized aero bodies, organize other bodies, issue pilot licenses and generally supervise and regulate aeronautic endeavor, hold meets and contests, maintain club house, develop science of aeronautics, establish aviation schools, encourage helpful legislation, cooperate with manufacturers of aerial products on the continents of North and South America and adjacent islands. Directors named to serve until first annual meeting: Joseph T. Adams (New York), Martin Bloomer (Westfield, N. J.), William Borchers (Brooklyn), A. Franklin Callahan (Chicago), James K. Duffy (New York), Mayer C. Goldman (New York), Clifford B. Harmon (New York), Joseph D. Havens (Kansas City), George Michael Haas (New York), James A. Hughes (Baltimore), Jerome H. Joyce (Baltimore), James B. Mee (New York), George A. Morrison (Cranford, N. J.), George M. Myers (Kansas City), Frank J. Palmer (Fanwood, N. J.), James E. Plew (Chicago), Augustus Post (New York), Joseph Snyder (New York), William B. Strang (Kansas City), Albert F. Zahm (Washington).

Pelletier Aeroplane Co., $25,000, New York City. Manufacture of aeroplanes, motors, engines, etc. Incorporators are H. E. Pelletier, E. J. Pierce and N. R. Green, New York City.

Burgess Company & Curtis, Marblehead, Mass. For the manufacture and sale of aeroplanes; capital of $80,000. Incorporators: President, W. Starling Burgess, Marblehead; treasurer, Greely S. Curtis, Rye, N. Y.; clerk, John Noble.

The Gallaudet Engineering Co., Norwich, Conn.; $100,000. Incorporators: E. F. Gallaudet, Denison Gallaudet and Grosvenor Ely, all of Norwich.

The Walden Manufacturing Co., New York City. To manufacture and deal in aeronautic devices. $10,000. Incorporators: Henry W. Walden, 37 St. Mark's Place; Abraham Levin, 1020 Simpson St.; Jacob Glass, 67 Second Ave., all of New York City.

America Exhibition Co., Atlantic City. For the holding of meets and the exhibition and flying of all types of air craft; $10,000. Incorporators: Charles B. White, A. T. Bell, J. Haines Lippincott, Harry B. Cook, D. S. White and Jacob Weikel, all of Atlantic City.

Aero & Motor Club of Asbury Park, $25,000; incorporators, Geo. W. Pittinger, A. R. Parsons, J. G. Warner, J. M. Ralston, H. E. Denegar, H. G. Rockefeller, C. A. Atkins, Milan Ross, J. L. Kinmouth, W. A. Berry, J. M. Ralston, C. R. Zacharias, Margaret H. Frost.

The William T. Thomas biplane has been making many good short flights at Hornell, N. Y. A full description of this machine appeared in a recent issue of AERONAUTICS.

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THE MOTT "ROTAPLANE."

To the Editor of AERONAUTICS:

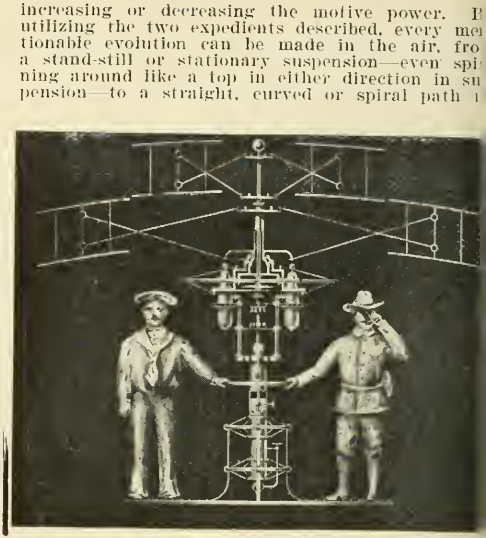
The accompanying illustration is an amplification of the air runner or Rotaplane set forth by the writer in the *Scientific American Supplement* of Oct. 25, 1902. In that article will be found, I think for the first time in print, the recently much-used word aviator, to designate the operator of a heavier-than-air flying machine. The general subject of orthogonal flight was illustrated and discussed by the writer in the above publications of Aug. 11, 1894; Jan. 30, 1904, and the *Electrical World* of June 20, 1896.

As a replica or close copy of the device herewith illustrated is now under construction, it is thought a brief statement of the characteristics we will doubtless establish may be of interest to readers of the fast developing aerial art, and they are certainly more numerous than when the articles referred to were published. This device is especially designed for warships and kindred purposes. For the army, for explorations or for preliminary surveys, etc., it may be dismantled for compact transport. The design for general commercial usage weighs less and appears somewhat different in aspect, as the aviators are seated and other expedients availed of for maneuvering, which will be described later. It may be flown from any place without a runway or other starting arrangements, and will alight at any unobstructed point where there is space for it to stand upon. It is intended for use as a ship's adjunct and flown from its deck. It may be flown from land; it may be flown from water. It will rest upon a sea of considerable roughness, when properly equipped therefor, and will rise therefrom with greater efficiency (less power) than from the land, because of lessened weight, due to partial submergence, and greater facility, because of the absence of drag due to vertical tilt as distinguished from forced translation through water and the consequent skin frictional resistance of any such attempts with monoplanes, biplanes or triplanes.

The modus operandi of the translation and direction of this machine is, curiously enough, the same physical principle that lends itself to the locomotion of land animals in walking or running—viz., the center of gravity displacement. That is to say, when in suspension the center of gravity of the machine is determined by the position of the load relative to the axis and the load is the operators, who are free to move together or separately about and around the axis or supporting pedestal of the machine. Obviously, then, the machine is careened and the cant or tilt of the axis to the points of the compass determines the direction of translation through the air, and it takes little cant to make high speed. It is easily shown that gyroscopic action will not interfere appreciably in the operation of handling this machine. The action of the gyroscope is only apparent when it is subjected to *quick* movements, or sudden precession, from its plane of revolution. The heavy wheels of a vehicle rounding a street corner, or the driving wheels of a locomotive rounding a curve, have a decided gyroscopic tendency: but we know it is negligible, due principally to comparative moderate rotative speed and the *gradual* changing of their planes of revolution.

Instead of so-called automatic stability, it is apparent that this machine has inherent stability like a boat; and this can be made adjustable by telescopic arrangement. Quite the same as a boat can be made variably stable by the weight and position of the load relative to the water line or plane of buoyancy. Hence the long training to acquire specialized skill is not necessary. The mental and ordinary requirements of a competent auto driver would be all-sufficient. Wind resistance is minimized by compactness, which, combined with weight, insures precision of movement when in the air. With proper equipment its shop cost would be moderate.

I have shown how the machine is directed by the center of gravity displacement. Other maneuvers, such as jockeying to attain altitude, are effected the same as we meet the up and down grades with our automobiles and other vehicles by increasing or decreasing the motive power. B utilizing the two expedients described, every mo tionable evolution can be made in the air, fro a stand-still or stationary suspension—even spi ning around like a top in either direction in su pension—to a straight, curved or spiral path



or down at any angle to the horizon—or ve tically—without the impedimenta of tail, win rudder, aileron or complicated mechanism, or th addition of a pound weight.

"The real future of flying, or rather the pra tical solution of the problem of the air," M Chanute thinks, "will come with the explosio motor turned into a 'sustention' engine," follow ing a statement that he does not foresee muc utility for aviation carried on along the presen lines. Doubtless the heart and key to all type of flying apparatus lie in the motive power, ar all types of engine will needs be adapted to th different types of machines, of which at the pre ent time there are only two in evidence of th heavier-than-air sort. Doubtless also the greate field for broadening and perfecting the aerial a is for the theorists to get busy and evolve a r liable fundamental power principle, or construction involving no reciprocating parts like the electr motor, for instance, which, unfortunately, is not prime mover. Then we will begin to see dayligh I know of at least two of some promise. Barrin this desideratum, we must do the best we can wit existing systems.

The original arrangement of the two-cycle en gine shown in the publication first referred to, c radially arranged revolving cylinders incorporate at the hub, has been introduced substantially o the same lines by the American Adams-Farwe and the French Gnome companies for aeronautica work. These rotatory engines have features c air-cooling and lightness which are very stron factors and are likely to be controlling for som types of flying machines. In the illustration here with I have eight two-cycle cylinders groupe around and parallel to the axis. The eight cy inders act as a unit, of course, through the trans mission. This makes a good arrangement in som respects, but, for certain mechanical reasons, th prime mover of the machine under construction i arranged as three twin-cylinders acting as a uni through a reverse motion differential speed trans mission of nickel-steel spur and internal gears The maximum power developed is 90 horse; th normal power is 75 horse for the three engines- i. e., six cylinders of 12½ horsepower each. Th engine has special features for clearing the cyl inder and purifying the mixture for perfect com bustion. It weighs about 202 pounds, or 2.7 pounds to the horsepower. I have aimed in th present construction to make a full-sized machine which can be considerably modified without recon struction for experimental data of which there i practically none extant. With that end in view

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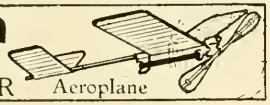

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the diameter over all may be varied from 12 to 17 ft. It is believed, however, that with high power and efficient screw action diameters of around 12 ft. will be sufficient for the practical working of Rotaplanes of medium-load capacity.

The illustration shows superimposed screw-blades supported by a tubular double-rim tangent wire-spoke wheel. This (rotary) biplane arrangement has not been tested out by the writer, but the machine under construction will determine the advantage or otherwise of this feature. The gasoline and lubricant are contained in the 1/32-in. sheet-steel pedestal. The carburetor has been changed from near the base to near the engine, so it will not be interfered with when alighting on the water. The total weight of the machine for two persons is about 400 pounds.

The word aeroplane, or monoplane, or biplane, or triplane, applied to the respective examples of present-day flyers, is a misnomer, because the supporting surfaces of all machines up to the present time have been aerocurves exclusively—something quite different. In view, however, of the hold these words seem to have on the popular imagination, I will venture to name the type of the machine illustrated herewith a rotary aeroplane or Rotaplane.

S. D. MOTT.

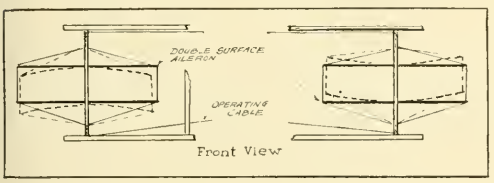
Passaic, N. J., July 30, 1910.

HAS 'PLANE—WANTS MOTOR.

W. J. Diefenbach has finished a 45-ft. Curtiss type biplane and needs a motor. He is willing to part with an interest in his machine and requests aid to this extent. Letters will reach him care of the Aeronautical Society, Mineola, N. Y.

J. C. PRESS HAS FLEXIBLE AILERON.

John C. Press, 100 Burritt Ave., South Norwalk, Conn., suggests a device for the maintaining of lateral equilibrium by means of flexible ailerons as shown in the sketch. These are fixed at an upward angle. To get increased lift on one side of the machine, the designer curves the aileron



down on that side and curves it up on the other. He claims that no turning movement will be caused by this device.

A LETTER FROM SOUTH AFRICA.

Joe W. Naude, Graaff Reinet, Cape Colony, is industriously working out some novel features in flying machines, not to mention an aeroplane that uses a small motor for starting only and a helicopter combined with a biplane glider. The novelties cover lateral automatic stability, aero brake, means for changing angle of incidence main planes during flight, shock-absorbing device and monowheel and skid combination, reversible propeller, vertical and horizontal rudders both fore and aft, cooling device for air-cooled motors in tropical climates, universal control, emergency second control, warmer for gas and oil in cold climates and at high elevations, fluting of under planes to prevent skidding.

WRIGHT AND CURTISS EQUILIBRIUM CONTROL.

Dear Sirs:—

I would like to give my idea of the difference between the Wright and the Curtiss equilibrium control.

When the Wright machine tips to one side, the low side is warped so as to increase its angle of incidence. In other words, the lift of the low side is increased and that of the high side decreased. The low side, having the greater angle of incidence, has more drift; this would make the machine travel in a circle with the low side toward the center, this tendency is overcome by manipulating the rudders.

The ailerons in the Curtiss machine are analogous to elevator rudders. Then when this machine tips to one side, the low side is steered up and the high side is steered down by manipulating the ailerons or wing tips. In a Curtiss machine flying there is no very noticeable movement in these ailerons, which goes to show that they move through very small angles. Since these surfaces are flat their drift at small angles is very slight, so that any difference of resistance (if there is any) at the wing tips is so slight as to be immaterial, therefore the machine does not deviate from its course.

E. S. LOCKE,
1519 Oxford St., Berkeley, Cal.

HAS NEW STABILITY DEVICE.

To the Editor:—

There has been so much talk of late regarding the Wright patent and the danger of their monopolizing and hindering the advancement of the art that I take this opportunity of showing a few different improvements designed to be used on any make or style of aeroplane and render flying safer and soaring more possible.

My objective point has always been an instantaneous control under all circumstances and conditions, all possible accidents considered and provided for, in my improved auxiliary plane system. I think I have accomplished all this and more.

Fig. I is a plan view of a machine with improved horizontal or elevating rudders, with which it is possible to steer up or down and to right or left and balance the machine simultaneously with one lever. The dotted line C, on main plane A, shows end of ribs and beginning of extremely flexible portion as shown in Fig. VI. A is rib; B is beam; C, rear end of rib; D, flexible portion of rib which in itself is an equalizer of pressure but may be warped down on the low side of machine either manually or automatically.

Fig. V shows two vertically disposed screens operating transversely of the machine, designed as an emergency or auxiliary lateral steering gear with which vertical cells or partitions must be used to prevent side drift as in Voisin type or may be used to stop machine when both are pulled out simultaneously. In construction they are simple and are practically the same as the ordinary roller curtain or window shade without rachets. The drawing represents a front view of both ends of machine: A, main planes; B, adjustable screens; C, cords; D, wire in front of which the screens operate, thereby allowing the action of the springs on screen, which would be prevented by the pressure otherwise; the idea being to present a desired amount of surface on the side corresponding to the direction (i. e. right or left) in which the machine is to be steered, retarding one side of machine and permitting the other side The longitudinal action front and rear is simultaneous. There is no transverse action of rear rudders except for emergencies. The advantages to revolve around to any position desired, might also be used to restore equilibrium to a certain extent by presenting surface on the high side of machine.

Fig. II is a sectional view of improved horizontal or elevating rudder, dotted lines showing their *longitudinal* action by means of which the equilibrium is maintained or instantly restored by tilting all auxiliary planes opposite the inclination of main planes; i. e., if the right side of main planes are low, tilt the auxiliary planes opposite so that the right sides of all auxiliary planes front and rear are high (Fig. II). B E are adjustable balls between which auxiliary planes operate; D is a guide passing through central support and preventing planes from getting out of their proper positions, is hinged on both sides of planes to allow transverse action; F, hinges.

Fig. IV is a side sectional view of rudder showing the transverse action common to all elevating rudders now in use.

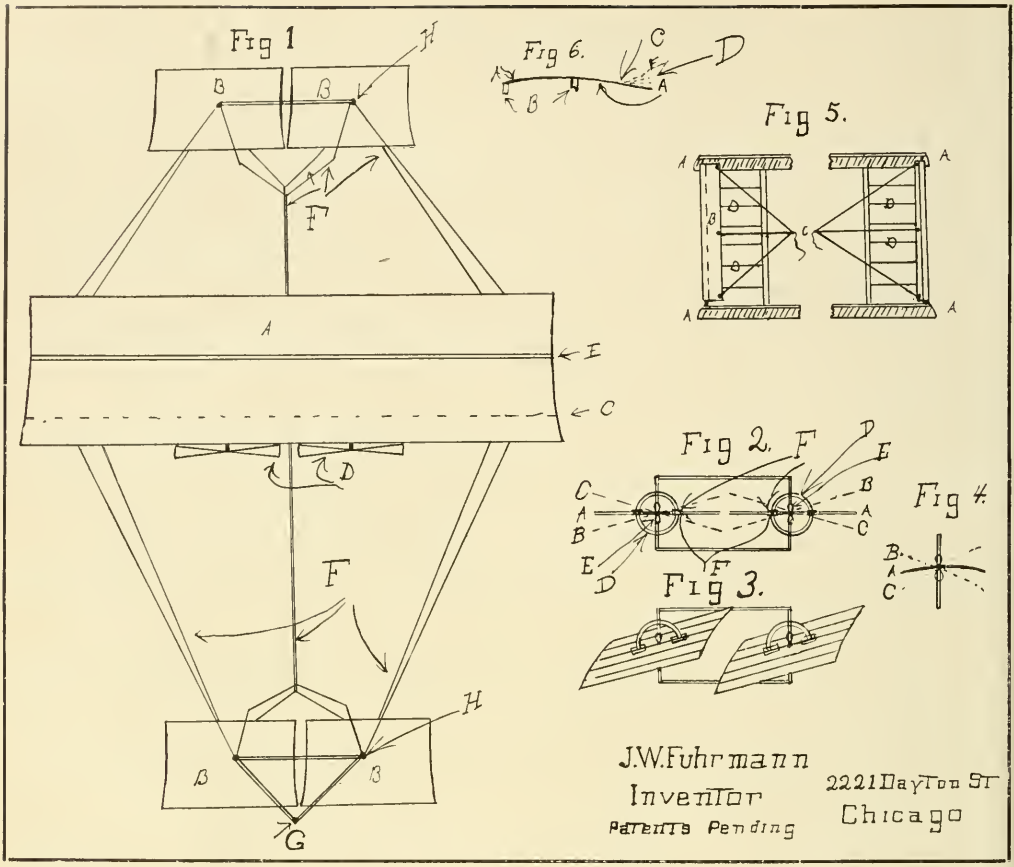


Fig. III shows a rear view of front rudders when operator is steering up and to the left, shows result of combining the longitudinal action Fig. II. B, and the transverse action Fig. IV. B. of this steering system are many, some of which are that it automatically banks machine and prevents side drift, the principle is identical to a bird's; it is safer and more practical; is more convenient, gives greater pressure and lifting power both on auxiliary planes and on main planes:; makes soaring more safe and dependable; does not require any vertical surface or rear vertical rudder: it is a one lever control, gives instantaneous balance, is not liable to break or get out of order, is simple and cheap and is not an infringement on any body.

The extremely flexible portion on rear of all planes is designed to copy as close as is possible the feather, which has a rigid stem with very flexible edges which bend up under pressure as in Fig. VI D, dotted lines showing various possible results of pressure. A slight propelling force would be derived from position E.

Fig. I G vertical rudder post, if one is used. F is the various parts of framework which must necessarily be altered to suit different types of machines; D, propellers; E, main lateral beam; H, central support on which rudders operate.

I will appreciate all criticism and opinion of those interested. I will gladly answer any questions and supply all further information at my command.

J. W. FUHRMANN.

2221 Dayton St., Chicago. Ill.

The monoplane of P. F. Gillette is nearing completion. This machine is, in the main, a "Bleriot" type, but is considerably larger and has a number of modifications. The spread is 34 by 29 ft. fore and aft. wings are detachable with "Farman" type ailerons on ends. A triangular body supports at the rear "Antoinette" type rudders, and carries also horizonial and vertical fins; two masts in center will support planes, which are 6 ft. 6 in. in depth. The ribs are of built-up construction and have the usual monoplane high camber; they will be double covered by Naiad cloth. Wheels 26 x 2½. Total surface. 208 sq. ft. Weight of machine without motor. 275 pounds; weight of entire machine without operator, 600 pounds. This allows 325 pounds for the complete power plant. A 50 horse power motor will be used. Body will be all covered.

Tod ("Slim") Shriver, for many years Captain Baldwin's right hand man, and selected by Curtiss when he was abroad last year, with H. J. Dietz, the lamp manufacturer, has organized the Hempstead Aeroplane Co., of Mill Road, Hempstead, L. I. Machines will be built for general sale as well as for exhibitions. The Kirkham 6-cylinder engine will be used.

The Hendee Mfg. Co., Springfield, Mass., makers of Indian motorcycles, are working on aeroplane engines of a very light weight, waterproof tight, of 4 and 8 cylinder, 25 and 50 h. p., respectively. The 8-cylinder type is of the "V" shape.

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ROBERT W. A. BREWER has been an important figure in the development of the aeroplan He is manager for Grahame-White, the British aviator. He is besides an engineer of wide e perience, who has specialized in the aeroplane. The work deals with the practical aspects flying machines, rather than with the theoretical side. It is essentially valuable because of t working drawings and the practical guides for those who would build or study the construction aeroplanes. Machines of various types are described in detail. Engines are also carefully considere with details of propellers.

It covers also the art of flying, including gliding experiments, steering, balancing and control. will interest the general as well as the scientific public.

The Main Chapter Headings Are:

hapter	I.	A Comparison Between Monoplanes and Biplanes.	Chapter	IX.	Materials of Construction for Aeropla
"	II.	The Form of an Aerofoil.	"	X.	Details of Manufacture.
"	III.	Early Models.	"	XI.	Successful Monoplanes.
"	IV.	Engine Problems and Principles of Design.	"	XII.	Biplanes.
"	V.	Description of Engines.	"	XIII.	Biplanes, continued.
"	VI.	Engines, continued.	"	XIV.	Progressive Monoplane Records.
"	VII.	Propellers.	"	XV.	The Art of Flying.
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Chapter XVII. Glossary of Terms.

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WONDERFUL ADVANCE IN FLYING—LE BLANC WINS 485-MILE RACE—45 NEW WORLD'S RECORDS IN MANY CONTESTS —SENSATIONAL FLIGHTS ACROSS PARIS—NEW HEIGHT RECORDS MADE AND BROKEN —CURTISS BEATEN.

Le Blanc Wins $20,000 Prize.

COVERS 485-MILE COURSE.

Aug. 17.—Alfred Le Blanc arrived at Issy, in the suburbs of Paris, at 6:45 o'clock this morning and is the winner of the cross-country flight which started from there on August 7.

For the *Matin's* $20,000 contest over the "Eastern Circuit," a distance of 782 kil. (485.91 miles), 35 machines entered. The prize was offered to the first aviator who, leaving Paris on the 7th of August returned by the 17th, after touching at the various points on the course. The various cities and individuals raised prize funds, in all totaling $52,500 and contests for height, starting, etc., were held at the various controls. Those who dropped out stayed to compete in the local events.

The race was divided into the following stages:

Paris to Troyes, 135 kil.
Troyes to Nancy, 160 kil.
Nancy to Charleville to Mezieres, 160 kil.
Mezieres to Charleville to Douai, 139 kil.
Douai to Amiens, 78 kil.
Amiens to Paris, 110 kil.

On August 7 eight actually started and six got to Troyes—Alfred Le Blanc (Bleriot) 1st, Emile Aubrun (Bleriot), Mamet (Bleriot), Lindpaintner (Sommer), Weymann (H. Farman), and Legagneux (Sommer). Le Blanc's time was 1:33:20.

Second stage, Aug. 8.—Le Blanc, Aubrun and Legagneux arrived. Le Blanc was fastest in 2:14:59.

Third stage, Aug. 11.—Le Blanc and Aubrun arrived. Le Blanc best in 2:04:00.

Fourth stage, Aug. 14.—Aubrun and Le Blanc reached Douai. Aubrun best in 2:40:00. Le Blanc took 3:00:00.

Fifth stage, Aug. 15.—Le Blanc, Aubrun and Legagneux flew from Douai to Amiens. Le Blanc best in 1:14:29.

Sixth stage, Aug. 17.—Le Blanc, Aubrun and Legagneux arrived. Le Blanc's time, 1:42. Total time of Le Blanc for 485 kil. cabled as 11:58:49.

French military officers flew part of the way with the contestants.

Le Blanc has been named for France in the Gordon Bennett balloon race, October 17.

NEW SHORT START RECORD.

Aug. 15.—Claude Graham-White made a new world's short start record of 20 ft. 9 in. with his Farman.

Aug. 14.—Either Louis Paulhan or Grahame-White will be awarded the *Daily Mail's* $5,000 prize for the greatest total of cross-country flying in France or Great Britain in the year ending August 14. Paulhan claims 780 miles and White 842.

Flights Day by Day

LATHAM WINS $2,000 FOR FLIGHT ACROSS PARIS.

Aug. 12.—Hubert Latham, coming from Bouy, flew over Paris at a high altitude and landed at Issy les Moulineaux.

By flying across Paris, Latham won the Falco Prize of $2,000. Latham's time was 2 hours 18 minutes 56 seconds.

NEW WORLD ALTITUDE RECORD.

Aug. 11.—J. A. Drexel (Bleriot) made a new world's height record of 6,750 ft. at the Lanark, Scotland, meet. This was recorded on his barograph which will be tested for accuracy. Fog obscured the view of the ground and he landed 15 miles away. He was up over 2 hours. The meet closed August 13; $38,450 were divided in prizes among 7 competitors.

FLIES WITH 462 POUNDS EXTRA WEIGHT.

Aug. 11.—At the aviation meet at Johannisthal, Germany, Thelen, in a Wright machine, made a flight in which he carried 462 pounds extra weight.

PAULHAN FLIES 200 MILES.

Aug. 11.—Louis Paulhan to-day made two round trips by aeroplane between Brou and Chartres, with stops. He covered in all a distance of about 200 miles.

FLIES IRISH SEA.

Aug. 10.—Robert Loraine (H. Farman, new type) flew from Blackpool meet across Irish Sea to Llandudno in Wales. Fog prevented returning all the way and a landing was made on Anglesey island. On August 1 he flew to Liverpool and back.

James Radley (Bleriot) who is coming to America to compete in the *Times* race and possibly the Gordon Bennett, made 58.32 miles per hour. Cattaneo flew 3 hours and 41 minutes. At a speed of 44.16 miles per hour. This was at the Lanark, Scotland, meet, August 6-13.

Aug. 10.—One of the propellers of a Wright machine broke at the Johannisthal meet and the aviator, Heim, was seriously injured.

LATHAM FLIES OVER PARIS.

Aug. 6.—Hubert Latham (Antoinette) flew from Chalons-sur-Marne to Paris, a distance of 87 miles, making two stops on the trip.

He passed over the city at an altitude of 1,850 ft., circling twice around the Eiffel Tower before landing.

The enthusiasm caused by Latham's flight had scarcely waned before the whirr of another propeller attracted attention. It was Weymann (H. Farman), who left Chalons shortly after Latham. Both landed at Issy les Moulineaux.

6000 FEET HIGH

Aug. 5.—Geo. Chavez at Blackpool meet, England, went up to 5,756 ft. in his Bleriot. On the same day, at Mourmelon, France, Weymann (H. Farman) tried to beat Brookin's record but came down after getting up to 4,100 ft.

FATALITY IN EXHIBITION BY WOMAN.

Aug. 1.—"Mme. Francke," while flying an H. Farman at Boldon, England, hit a flag pole with one of the wings of the aeroplane, turning the machine over. A boy was struck by the engine and killed. Mme. Franck suffered a fractured leg and some cuts.

WORLD RECORDS FOR 4-MAN FLIGHT.

Aug. 1.—Henry Farman carried three passengers at Mourmelon for 1 hour 4 minutes, the total weight carried including gas, oil and passengers was 627 pounds.

On the same day, at Douai, De Baeder carried three passengers on a Bregi biplane. Total weight carried was 708 pounds.

GERMAN AIRSHIP IN LONG TRIP.

July 27.—German airship "Gross III" makes trip of 170 miles in night ascent lasting 7 hours 50 minutes, Berlin over various cities to Gotha. Return was made on the 30th, trip lasting 6½ hours.

FLIGHT TO ALTITUDE 8,475 FEET.

July 27.—Reports from Italy state that two Swiss aviators flew up a mountain which is said to be 8,475 ft. above sea level, circling above the peak and returning safely.

July 9.—Maurice Tabuteau (Maurice Farman) flew 3 hours 35 minutes at Buc.

OVER PARIS IN AEROPLANES.

July 13.—Champel (Voisin) flew from Juvisy to Paris to Sartroville, 50 kil., in 45 minutes.

July 14.—G. Busson (Bleriot) Juvisy-Paris-Bagatelle and return without stop.

The Aero Club of France has issued to date 150 aviation pilot certificates.

Germany is organizing a city-to-city race, Frankfort—Wiesbaden—Mayence—Mannheim, with prizes of 41,000 marks.

Postscript, Aug. 17.—John B. Moissant, of Chicago flying a Bleriot Monoplane and carrying a mechanic with him flew from Paris to Amiens and thence across to England in an attempt to fly to London. He landed near Dover.

BIG FOREIGN MEETINGS

Brussels.

N. KINET KILLED.

Next the last day of the Brussels meet, July 23-August 4, was marred by the fatal accident to Nicholas Kinet when, on August 3, he was caught in a squall in his H. Farman biplane and dashed to the ground. Kinet and Olieslagers were tied for the totalization prize with 16 hours 1 minute. The longest single flight was made by Jean Olieslagers on Aug. 3, 219.8 kil. Prize money totaled $27,600, cash and trophies.

BROKE FRENCH HEIGHT RECORD.

On July 30 Olieslagers broke the French height record, being credited with 1,460 m. (4,788 ft.). The barograph showed 5,084 ft. On August 1, Jules Tyck (H. Farman) went up to 4,834, officially, though he claimed 6,641 ft.

Caen Meeting.

With prizes totaling $9,700, Caen meeting, July 27 to August 2, Bleriot machines won $3,200 and Hanriot $2,600, balance divided between six others. Longest single flight was on July 30, by Paillette (Sommer) 3:13:56. On August 2, Morane (Bleriot) won height prize with 4,100 ft. Hanriot (Hanriot) won total distance prize with 9:57:56.

Bournemouth (Eng.) Meet.

July 16.—Fifteen fliers at Bournemouth meet, July 11-16; $40,000 in prizes. Among other contests, L. F Morane (Bleriot) won the fastest lap prize at a speed of 56.64 miles per hour, while his time for 5 laps was 55.9 miles per hour. Hon. C. S. Rolls (Wright) won the slow speed test at 25.33 miles per hour. Morane also won altitude prize, going up to 4,107 ft. The longest single flight was 90 miles by Grahame White (Farman) at a speed of 35.2 miles per hour. In the weight carrying contest White was best with 425 pounds, including pilot. In alighting White was first, stopping within 7 ft. of the mark. The Bleriot machines had two sets of wings, one for lifting and one for speed. J. A. Drexel and W. E. McArdle, who have a flying school at Beaulieu, flew their Bleriots to the meet and back again at its conclusion. On the return Drexel carried a passenger home with him, the trip lasting 38 minutes.

At the Lanark, Scotland, meet, August 6-13, the prizes totaled $40,000.

Rheims' Meet.

MANY WORLD RECORDS ESTABLISHED AND BROKEN.

July 10.—Rheims meet closed after 7 days of flying. Of the 72 entered 46 competitors actually flew a total distance of 8,500 miles and $38,000 distributed in prizes.

The longest distance flown by one make of machine, 2,601 kil., by the Antoinette.

The best total distance by one man was 1,693 kil. in 19¼ hours, by Olieslagers (Bleriot).

Longest single flight, 392.75 kil., 5hrs. 3 min. 5 1/5 sec., by Olieslagers (244.04 miles).

In Gordon Bennett elimination race to select French contestants, over 100 kil. course, Le Blanc (Bleriot) 1st in 1:19:13 3/5; 2nd, Latham (Antoinette) in 1:24:58 3/5; 3rd, Labouchere (Antoinette) 1:25:24.

The following new world's records were established:

Distance and Duration.—392.75 kil. (244.04 miles) in 5 hr. 3 min. 5 1/5 sec., by Olieslagers (Bleriot).

Speed Over Certain Distances.—5 kil., Morane (Bleriot), 3 min. 14 3/5 sec.; 10 kil., Morane, 5 min. 42 2/5 sec.; 20 kil., Morane, 12 min. 45 3/5 sec.; 30 kil., Olieslaegers (Bleriot), 23 min. 31 sec.; 40 kil., Olieslaegers, 30 min. 11 sec.; 50 kil., Leblanc (Bleriot), 37 min. 50 3/5 sec.; 60 kil., Leblanc, 45 min. 28 3/5 sec.; 70 kil., Leblanc, 53 min. 32 4/5 sec.; 80 kil., Leblanc, 1 hr. 2 min. 22 3/5 sec.; 90 kil., Leblanc, 1 hr. 11 min. 15 2/5 sec.; 100 kil., Leblanc, 1 hr. 16 min. 11 sec.; 150 kil., Olieslaegers, 2 hr. 3 min 49 1/5 sec.; 200 kil., Latham (Antoinette), 2 hr. 46 min., 2 sec.; 250 kil., Olieslaegers, 3 hr. 34 min. 53 4/5 sec.

Distance for Certain Period.—In ¼ hr., Leblanc (20 kil.); in ½ hr., Leblanc (40 kil.); in 1 hr., Leblanc (80 kil.); in 2 hrs., Olieslaegers (145. il.) in 3 hrs., Latham (215 kil.)

Speed With One Passenger.—10 kil.: Ladougne (Goupy), 8 min. 14 2/5 sec.; Aubrun (Bleriot): 20 kil., 19 min. 39 1/5 sec.; 30 kil., 29 min. 10 sec.; 40 kil., 38 min. 51 sec.; 50 kil., 48 min. 28 sec.; 60 kil., 57 min. 58 2/5 sec.; 70 kil., 1 hr. 7 min. 31 1/5 sec.; 80 kil., 1 hr. 16 min. 59 2/5 sec.; 90 kil., 1 hr. 26 min. 33 sec.; 100 kil., 1 hr. 36 min. 6 sec.

Distance With One Passenger.—Aubrun, 137.125 kil.

Duration With One Passenger.—Aubrun, 2 hrs. 9 min. 7 4/5 sec.

Speed With Two Passengers.—Mamet (Bleriot): 10 kil., 10 min. 18 4/5 sec.; 20 kil., 21 min. 14 sec.; 30 kil., 31 min. 53 1/5 sec.; 40 kil., 42 min. 32 2/5 sec.; 50 kil., 52 min. 36 1/5 sec.; 60 kil., 1 hr. 3 min 20 3/5 sec.; 70 kil., 1 hr. 14 min. 36 3/5 sec.; 80 kil., 1 hr. 23 min. 33 sec.; 90 kil., 1 hr. 36 min. 4 sec.

Greatest Distance With Two Passengers.—Mamet, 92.75 kil.

Average Speed per Hour.—106.508 kil. (66.18 miles), Morane (Bleriot) with 100 horse-power, 14-cyl. Gnome engine.

The Leblanc Bleriot has 100 horse-power Gnome engine while the Antoinettes are of 50 horse power. The Olieslagers Bleriot was of 50 horse power and the Morane Bleriot, 100 horse-power Gnome.

Anthony Castellane, the "loop-the-gap" bicyclist, has arranged to fly a Farman-type machine for Fred Shneider, and is now at Seabright, N. J., practicing. The Elbridge engine gave 190 lbs. thrust at 980 r. p. m.

Some propeller tests at Mineola recently showed up 360 lbs. on Harmon's 50 h. p. Gnome-engined Farman, and 300 lbs. with the Elbridge-40 on Joe Seymour's Curtiss. The propellers were Requa-Gibson.

NEXT MONTH

Notes on Propeller Design and Construction

By Spencer Heath

ASCENSIONS

NOTE—ASCENTS MARKED (*) ARE OVER 100 MILES IN LENGTH.

Lowell, Mass., July 14.—Chas. J. Glidden, pilot, Col. W. M. Bunting and Chas. A. West in the "Massachusetts" to Pelham, N. H. Distance, 8 miles; duration, 1 hour; altitude, 3,300 ft.

ALL NIGHT TRIP.

*Hamilton, O., July 18.—W. C. Collins and George Howard in the "Drifter" to Mt. Pleasant, 11 miles south of Anna, Ill., the following day. It was planned to break the U. S. duration record. Duration, 10½ hours; distance, 295 miles.

Pittsfield, July 19.—N. H. Arnold, pilot, F. S. Hoppin and George Von Utassy in the "Springfield," landing at Lenox. Duration 2 hours and 40 minutes; distance, 6 miles.

DR. ELDRIDGE MAKES RECORD PHILADELPHIA ASCENT.

*Point Breeze, Phila., July 20.—Dr. Thomas E. Eldridge, pilot, F. S. Underhill and A. B. Underhill in the "Philadelphia II" to 2 miles north of Pascoag, R. I. Distance, 231.125 miles; duration, 12 hours 5 minutes; altitude, 10,550 feet. Of Dr. Eldridge's 19 trips, he says, this was the best of all. The beauties of the scenery were indescribable. For 6½ hours during the night of the 20th only 1½ bags of ballast were used to keep the balloon at an average altitude of 1,100 to 1,400 ft. During the trip the states of Pennsylvania, New York, New Jersey, Connecticut, Massachussetts and Rhode Island were sailed over in this record ascent from Philadelphia.

St. Louis, July 24.—Andrew Drew, qualifying as pilot in the "Missouri" to Collinsville, Ill., going the 19 miles in 25 minutes.

Jackson, Mich., July 29.—N. H. Arnold, pilot, and L. E. Hayden.

Jackson, Mich., July 26.—N. H. Arnold, pilot, H. W. Alden and Burns Henry. Distance, 4 miles; duration, 3 hours; altitude, 4,000 feet.

Jackson, Mich., July 27.—N. H. Arnold, pilot, W. W. Clarke and Frederick Lewis in the "Mich. No. 1," the new balloon of the A. C. of Michigan.

*Pittsfield, July 27, 1910.—W. H. Van Sleet, pilot, and Alton Farrel, in the "Springfield," landing at Wickford, R. I. Distance, 107 miles; duration, 5 hours and 15 minutes

ANOTHER NIGHT ASCENT.

*Hamilton, O., July 28.—W. C. Collins, George Howard and Jean Arent in the "Drifter" to 4 miles west of Marion, O., on the 29th. Duration, 14 hours 25 minutes; altitude, 8,000 feet; distance, about 115 miles.

LONG TRIP FROM CANTON.

*Canton, O., July 30.—J. H. Wade, Jr., A. Leo Stevens and Jack Allen in the new Wade balloon "Buckeye" to 6 miles west of Denver, W. Va. Denver not on the atlas. Distance to county seat of Preston county is 132 miles.

Jackson, Mich., Aug. 1.—Mr. and Mrs. Wedworth Clarke up in the "Michigan."

Pittsfield, Aug. 3.—Wm. Van Sleet, pilot, W. M. Remington and S. H. Hancock in the 'Springfield," to Grafton, N. Y. Distance, about 35 miles; duration, 2 hours 40 minutes.

ANOTHER NEW PHILADELPHIA RECORD.

*Point Breeze, Aug. 3.—Dr. Thomas E. Eldridge, pilot, and Welsh Strawbridge left at 9:28 P. M., in the "Philadelphia II" to 2½ miles north of Danbury, N. H., landing at 8:30 A. M. the following morning. After being in the air two minutes over 11 hours, covering a distance of 303.8 miles.

NIGHT TRIP.

*Lowell, Mass., Aug. 10.—J. B. Benton and J. Walter Flagg in the "Boston" to North Haverhill, N. H. Distance, 107 miles; duration, 5 hours 45 minutes.

Pittsfield, May 20.—Wm. Van Sleet, pilot, Messrs. Hunter and Smith, passengers, in the "Massachusetts," to Cheshire, Mass. Distance, 11 miles; duration, 30 minutes.

Pittsfield, June 5.—Wm. Van Sleet, pilot, J. B. Benton and a Mr. Parker, in the "Massachusetts," to Bennington, Vt. Distance, 31 miles; duration, 6 hours, 53 minutes.

CLUB NEWS

The Pittsburg Aero Club has been formed at Pittsburg, Pa., with the following officers: W. L. Smith, president; George H. Flinn, first vice-president; S. A. Pickering, second vice-president; C. A. Painter, third vice-president; J. A. Glesenkamp, fourth vice-president; H. P. Haas, secretary, and F. H. Richards, treasurer.

The Junior Aero Club of the Omaha Y. M. C. A. is encouraging model building. Each member is now building a model for a contest to be held during the aviation meet at Omaha July 23-27. A prize of $25 for first and $15 for second, with Glenn Curtiss as judge, is offered. The boys are given practical instruction in the building of models and the general principles of aviation, together with a detailed description of the leading models used to-day for flying. Sergeant C. F. Adams of Fort Omaha is instructor.

The **Aeronautical Society** was addressed by M. E. de Jarny on the subject of "Aviation Motors" on July 28. On August 11, the following subject was discussed by Messrs. J. Bernard Walker, editor of the *Scientific American*, Walter L. Fairchild, Rex. C. Norwood and Wilbur R. Kimball: "Cautionary Methods in the Trying Out of New Machines."

The **Aero Club of Blackstone Hill,** Oakland, Cal., is another boys' club, though little has been heard in the East of it. It was formed about two years ago with W. R. Davis, Jr., of 474 Prospect St., as president, and W. Moller, as treasurer. It has devoted its efforts mostly to models and gliders.

The **Aero Club of New England** has sold its 56,000 cu. ft. balloon "Massachusetts," and will buy a rubber racing balloon of 80,000 cu. ft. capacity.

The **Aero and Motor Club,** of Asbury Park, has been formed to "promote aviation and motoring and to conduct exhibitions in these sports," with a capital stock of $25,000.

The **National Council of the Aero Club of America** has established its headquarters in the Engineers' Building, No. 29 West 39th St., New York City, and members will always find a welcome in room 918 at the above address where there is an office staff always in attendance during regular business hours.

It is proposed to keep on file all publications of interest to the members of the Council and Secretaries of the various organizations are requested to send such publications as will be of interest in this connection.

At a luncheon arranged by Clifford B. Harmon and Gage E. Tarbell, before the latter's falling-out with the Aero Club, at which affair a number of members of the Club and the Aeronautical Society were present, it was decided to ask both organizations to appoint a representative to meet and endeavor to arrive at an understanding with regard to the friction which the Club insists exists between it, as parent, and the Society, as offspring. It was suggested at the luncheon that the representatives be Mr. Harmon for the Club and Hudson Maxim for the Society. The Club, however, appointed W. W. Miller, an attorney, and the Society delegated Thomas A. Hill, also a lawyer and a "rank insurgent" in the Club. Mr. Harmon was thought by the Club not to be eligible to the honor, as he is also a member of the Society, though sort of a non-resident. No conference has been held, no official communications have passed, and the idea is thought to have succumbed to dry rot.

What has become of the Aero Club of Philadelphia? Letters addressed to them are returned by the post office. The same is true of the Aero Club of the Northwest, St. Paul.

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New Advertisers.

Each month marks the entrance into the aero field of well-known concerns who are taking up the new industry, or entirely new houses who see opportunities in various branches of aeronautics. Among these new advertisers this month may be noted:

Tiger Cycle Works.
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Corrected Figures New York-Philadelphia Flight.

Unfortunately for the standing of one of the first great cross-country flights in the States, that of Charles K. Hamilton from Governor's Island to Philadelphia and return, it seems evident that the official timers employed by the New York *Times* have made an error on the return portion from South Amboy to Governor's Island. The distances which were given out by that paper were far from correct, as we mentioned at the time.

Using the flying time of the *Times*, Hamilton made *57.66 miles per hour from South Amboy to Governor's Island, doing the distance of 22.105 miles in 23 minutes. No doubt this time should have been 33 minutes, a speed of 40.19 m. p. h. In view of the speed made going to Philadelphia, without stop, when everything was working well, 43.29 m. p. h., it does not seem probable that the great increase was made on the second half of the return journey, when the engine was even missing fire.

It is not intended to detract one iota from the achievement, but merely to follow out our intention of having nothing in the magazine but that which is accurate, when accuracy is possible to be attained.

Following are the *exact* distances, computed by Mr. Williams Welch, chief draftsman, office of the chief signal officer, U. S. A., and the newspaper figures on the time. No accurate time was officially taken by any aero organization:

Governor's Island to Philadelphia, 74.314 miles, 103 minutes.

Philadelphia to South Amboy, 53.125 miles, 81 minutes.

South Amboy to Governor's Island, 22.105 miles, 23 minutes.

Average speed to Philadelphia, 43.29 m. p. h.

Average speed to South Amboy, 39.35 m. p. h.

Average speed to Governor's Island, *57.66 m. p. h.

Total distance flown, 149.544 miles.

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TYPEWRITERS.—All makes. Caligraphs $6.00; Hammond, Densmore $10.00; Remington $12.00; Oliver $24.00; Underwood $30.00. 15 days' free trial and year's guarantee. Harlem Typewriter Exchange, Dept., F. 18, 217 West 125th St., New York City.

AEROPLANE—Position wanted by woodworker and mechanic experienced in aeroplane and gas engine work. DAVIS, care of AERONAUTICS.

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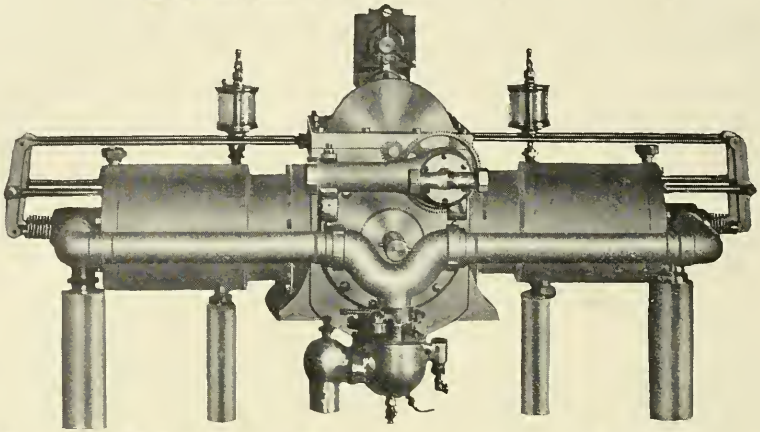

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Other Aviation Engines possess a few of these advantages. This is the only engine that combines them all.

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and thereby avoid the unnecessary expenses, accidents and barriers to success that naturally follow in the wake in the purchasing of an **untried** product.

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More and more we realize this as brilliant success, and brilliant failure too, are recorded. It is to the engine we must pin our faith to bridge that distance between us and a complete mastery of the air. To all who are putting forward a strenuous effort to achieve this end, a RINEK motor will prove of invaluable assistance. They are the lightest, practicable, water-cooled aviation engines yet produced, and run with faultless precision.

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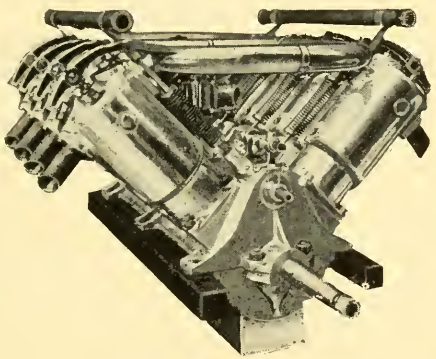

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THE RINEK AERO MANUFACTURING CO.

EASTON, PENNA.

K TIMES, THURSDAY, JUNE 16, 1910.

WHAT CAUSED A HALT IN HAMILTON'S FLIGHT

Curtiss Finds the Quality of Oil Supplied in Philadelphia Forced the Flier to Descend.

SOME PROBLEMS SOLVED

Moot Points In Aviation Cleared and Aerial Travel Thus Made Less Hazardous.

Glenn H. Curtiss, who was a make[r] of bicycle engines before he was [t]ked over Charles K. Ha[m]-esterday and found [t]ought the flying [m]hile winging [t]New York

them had worn almost through. Had it worn all the way it would have released one aileron from the flyer's flexible seat, and would have made it impossible ever to regain level keel once a sidewise wind had started the planes gliding off on a slant.

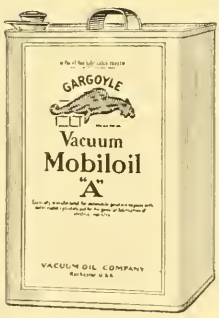
The answer Curtiss found again when he landed at Governors Island was that his oil tank had rubbed against a brace on account of the engine's vibration, and had worn a hole in its side, thus dropping his oil gauge to "empty" when he still had a dozen miles to travel.

Hamilton's first accident, in which a propeller blade was chipped, occurred because engineers, applying for building on Governors Island, had driven a section of the aviation field full of surveyors' stakes. Only the night before he dropped a wire on one of these stakes, and in taking another chance of spinning safely through them next morning he met a [s]light

As to his second accident on the long flight, Hamilton's mechanic had seen the can of light oil that a Philadelphia concern had supplied instead of the brand ordered, and had refused to accept it. A TIMES representative promptly dispatched a fast automobile for a can of the proper brand. Ten minutes before the automobile was due to return light rain began to fall and storm clouds appeared in the west. Hamilton looked them over; he had set his heart on winning the round trip flight from New York and back, and realized that every minute counted. He wasn't willing to await fair weather and exactly the right oil, so he seized the can himself, filled his tank, and in a minute or two more was up in the air and off.

HO[M]E HAMILTON.

N.Y. TIMES



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Vacuum Oil Company,
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New York City.

Dear Sirs:

I am pleased to report the success we have met with in the use of "Mobiloil" in lubricating the engines in our aeroplanes, and to say that it maintained its reputation in my Albany-New York flight.

Very truly yours,

June 6, 1910. G. H. Curtiss.

Vol. VII OCTOBER, 1910 No. 4

AERONAUTICS

THE AMERICAN MAGAZINE OF AERIAL LOCOMOTION

PRICE 25 CENTS 39th ISSUE

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Harriman Engines

. . . in . . . first attempts

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30 H. P.
Complete Power Plant
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NOTE:—Mr. Geo. Russell in his endeavors to fly at the Richmond County Fair, Staten Island, did not use a Harriman engine

Harriman Motor Works, So. Glastonbury, Conn.

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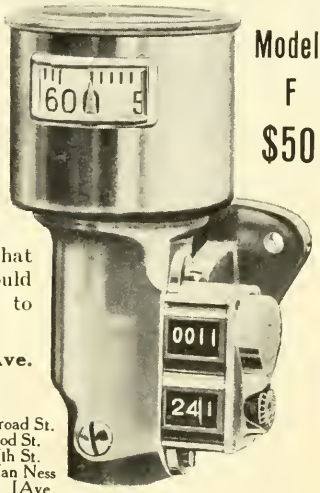

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e Three-States Aero Show

N account of the postponement of the International Meet and the subsequent conflict of dates, the REE-STATES AERO SHOW, announced to be in Philadelphia, October 22nd-November 5th, will eld November 2nd-12th, inclusive.

As this is only ten days instead of two weeks, es of floor space have been reduced 25%. Attractive divisions can now be made and arrangements closed showing small exhibits at low prices.

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A larger machine

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One Biplane complete, less motor	500.
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On account of the pressure of other business we have discontinued the manufacture of aeroplanes. The above prices are way below cost to close out quickly. If interested, write at once.

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Long Lengths of Selected Straight Grain

Spruce--Pines--Bass--Whitewood--White Cedar, Etc.

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The French Gnome Engine will be furnished for the additional sum of $2,600 on machines only at this combined figure

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Free tuition to purchasers.

Only a limited number of machines to be sold at the above figures, ***prices will advance shortly.***

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Actual practice in the Art of Flying. Aviators' diplomas issued on qualifying. Technical training; how to build, lectures, etc., by Prof. Harrison, motor expert, master of mechanics and profound student of aviation for the past three years.

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Santos Dumont Type

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To Aeroplane Meet Promoters

MAN-CARRYING BY KITES

was for the first time in America demonstrated as an attraction at the Harvard-Boston Aero Meet.

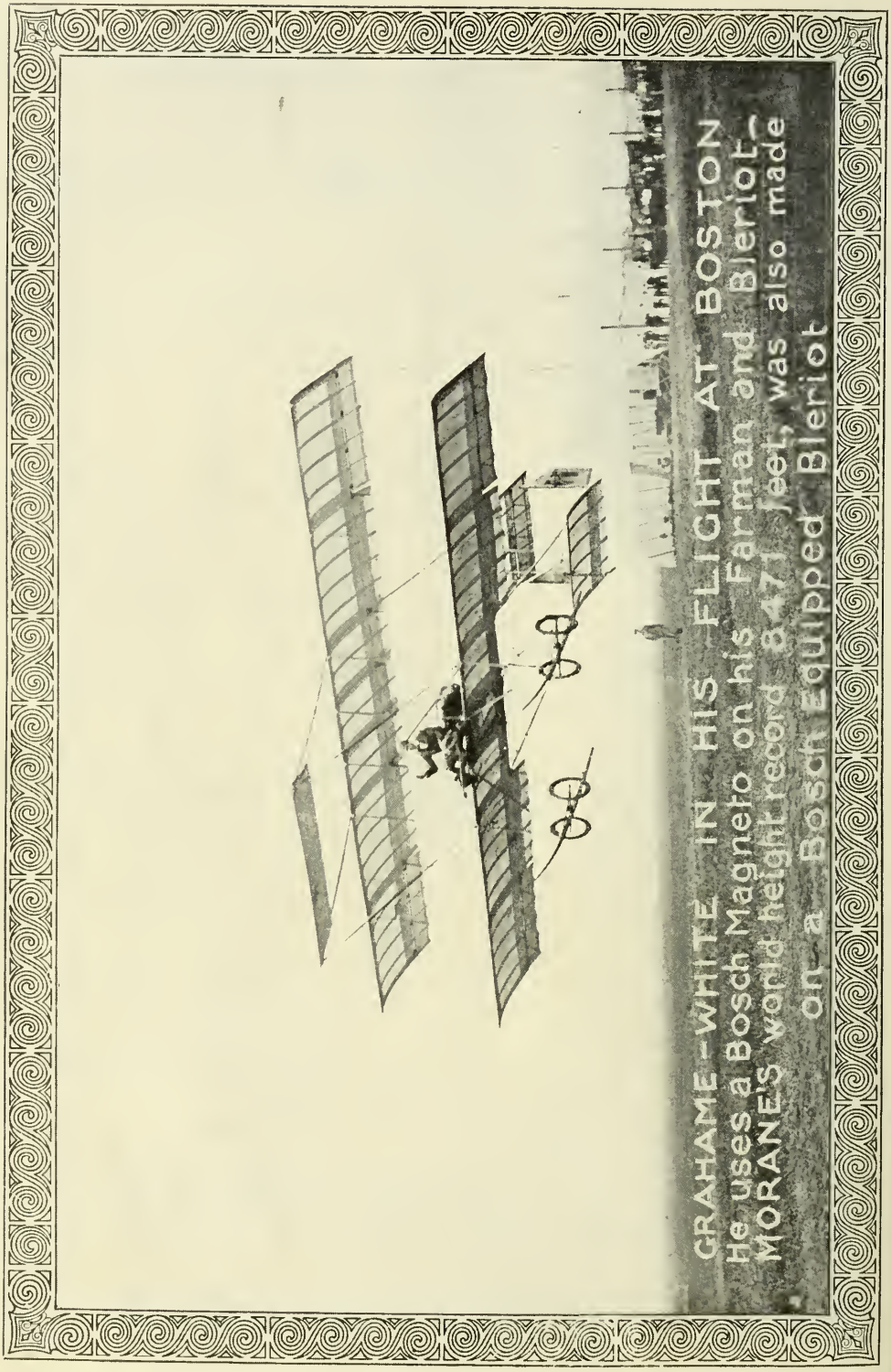
¶ There it was shown how easily a man could be sent 200 ft. in the air supported by from 6 to 15 enormous 18 ft. passenger carrying kites.

¶ The height to which he can go (up to 1,000 ft.) varies only with the wind velocity and nerve of the operator.

¶ The Army officers present testified as to its great value for scouting purposes in war.

¶ As this feature is at its best when the winds are so strong that the aeroplanes cannot fly, it is especially valuable as an attraction at Aeroplane Meets.

SAMUEL F. PERKINS, 110 Tremont St., Boston, Mass.


GRAHAME-WHITE IN HIS FLIGHT AT BOSTON
He uses a Bosch Magneto on his Farman and Bleriot
MORANE'S world height record 8,471 feet, was also made
on a Bosch Equipped Bleriot

AN AMERICAN BALLOON TRIP OVER ROME

Some Noted Events and Thrilling Experiences in Balloon Voyages in All Parts of the World, Written Especially for "Aeronautics."*

By Rufus G. Wells

IN 1870, after winning a balloon race in London with an English aeronaut, I went to Paris to offer my services to the new Republic. There I was employed by the Defense Nationale to construct a balloon for taking General Bazaine with his officers out of Metz and carrying them over the German army and landing them in France. From silk furnished by the government, I made a balloon two hundred feet in length. About the time that this was completed, the largest balloon at the time ever constructed, we were disappointed by the surrender of Metz by General Bazaine.

A most interesting experience in my ballooning took place during the World's Fair at Paris in 1889. I made an ascension in company with William J. Hammer, electrical engineer and director of Thomas A. Edison's exhibit at the Exposition, and Dr. A. Lawrence Rotch, director of the Blue Hill Observatory at Boston. Many interesting experiments, both electrical and astronomical, were made on the voyage. The balloon was in the air about four hours, traveling on an average twenty miles an hour.

On one occasion I made an ascension from a beautiful garden in Copenhagen. I was carried by the wind over to Sweden and landed in the sea, where I was rescued by men in boats.

On a visit to Italy I made an ascent at Milan during a festival. The balloon rose to the height of three miles, and I then made a descent in a parachute, to the great astonishment of the multitude, being the first exhibition of the kind they had ever witnessed.

From Italy I went to Constantinople, where I made an ascent over city, obtaining a magnificent view of the palaces, temples and mosques. On my descent I was well paid by the Sultan, who also gave me some rich and splendid gifts.

On an extensive tour in India I made many ascensions in the most celebrated cities—Bombay, Delhi, Agra, Lucknow and Calcutta. The Maharajah of Cochin gave me a bag of money and took a diamond ring from his finger and made me a present of it. At Akyob, in Burmah, I made an ascension and was carried out over the sea. On being rescued by men in a boat and taken to land the people gathered around me, believing that one of their gods had appeared amongst them.

During a summer spent in the island of Java I made the first balloon ascension in Batavia that had ever been witnessed there. The balloon passed up through a cloud and the people thought it was the last they would ever see of me. I went off about 100 miles and landed on a rich tea and coffee estate, to the great astonishment of the natives at work there.

In South America I made ascensions at Lima, Peru; at Rio Janeiro and at Buenos Aires. At the latter place I descended in the La Plata River. On throwing out ballast the balloon rose so rapidly that the sun which had just gone down was seen rising about the horizon, in the west instead of the east.

On different visits to Mexico I made sixty ascensions, and received full remuneration and utmost courtesy from the people wherever I went. I was the first aeronaut to make a parachute descent in that country.

*Rufus G. Wells, up to his death the oldest living American aeronaut, died on August 3d at his home in St. Louis, aged 80 years, while sitting in his chair, stricken with apoplexy. An account of Mr. Wells' experiences in ballooning was written by him for AERONAUTICS in the fall of 1908. His most interesting story will be found in this issue.

Rufus G. Wells

WANTED TO CROSS THE ATLANTIC.

It was my desire to cross the Atlantic with an immense airship seven thousand feet in length and two hundred feet in diameter, inflated with hot air, and enough fuel to burn and provisions to last on the way, not only to cross the ocean, but to go around the world with some brave companions. I ought to have carried out my project long ago, and to have been the first one to reach the North and South Poles with a gigantic dirigible. If wealthy men would assist, immense airships could be made to carry a hundred persons with safety to any part of the world.

All governments should use great airships in war and to visit all parts of the earth. I was very much pleased to carry the Stars and Stripes higher over Rome and other cities than any other person has ever waved them.

THE AMERICAN FLAG OVER ROME.

The Pope and Governor of Rome said I must not wave our flag over Rome—but I did wave it in spite of them, and they said I could not make another ascent from Rome.

(*Continued on page 135*)

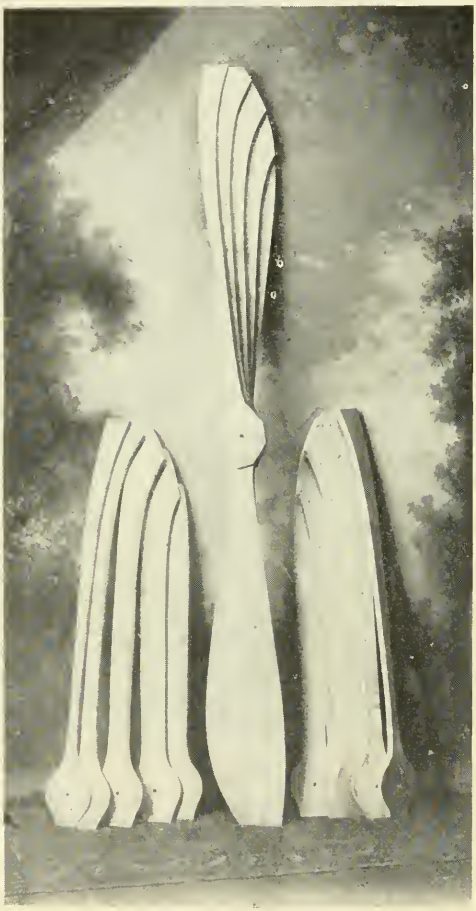
PROPELLER DESIGN AND CONSTRUCTION

By Spencer Heath,

OF THE AMERICAN PROPELLER CO.

SOME remarkable results are being attained by the American Propeller Co. from their "Paragon" propellers, according to the report of the Emerson Engine Co., of Alexandria, Va., which is putting a new 6-cylinder 2-cycle aeronautical engine on the market.

A "Paragon" propeller tested by them on one of their engines which they sold recently to Dr. W. W. Christmas of Washington, D. C., for his new biplane, Red Bird, now being experimented with at College Park, Md., gave the extraordinary



thrust of 456 pounds at a speed of 1,100 r.p.m. The propeller was designed specially for the particular surface-weight ratio and other properties of the Christmas machine and the speed and power of the engine, the aim of the designers being to adapt the actual flying thrust of the propeller to the head resistance of the machine at its calculated speed of travel and that the propeller shall have the least disturbing effect upon the air when the engine is running at its most efficient speed of about 1,100 r.p.m.

The propeller in question is 8 ft. in diameter, by a pitch varying from 4½ ft. to 5 ft. at different parts of the blade. The material is all edge-grained white spruce with five laminations in each blade, all of the pieces being spliced or scarfed together at the hub in the manner characteristic of the "Paragon" propellers and all the glued joints throughout the blades being made doubly secure by numerous birch dowels regularly spaced. The hubs are faced with hard maple. The weight is 10¾ pounds.

It might readily be assumed from the great standing thrust yielded by the "Paragon" propellers that they are designed particularly with this result in view, but that is not the case, the standing thrust being merely incidental to a good design for giving thrust at speed.

The main feature of the American Propeller Co.'s work is to furnish propellers designed intelligently and scientifically for each individual case, believing that no standard design can be evolved while there is such wide diversity in flying machine construction. This diversity is shown in the extreme variations in surface-weight ratio, from about two to perhaps six and one-half or seven pounds per square foot of surface, to say nothing of the radical structural dissimilarities in different successful machines.

Each propeller is designed with three conditions in view: The most efficient running speed of the engine, the speed through the air at which, with proper propeller design the available power ought to carry the particular machine; and the estimated head resistance at this speed. From this preliminary data is derived the winding or helical path to be traversed by every portion of the blade, and every 6-in. section of the blade is designed with reference to the work it must do while traversing this path as an aeroplane (more properly "aerofoil") following a helical instead of a plane horizon. Each different blade section is given a suitable form and angle of incidence to its horizon, according to its particular speed, its necessary width and its relation to the other parts of the blade, and the entire number of sections so determined are combined into a single blade having harmonious properties throughout. This method of design naturally results in a blade of variable pitch at different distances from the center. In the progress of every design this variable pitch and all the other important properties of the blade, such as the gliding angles, coefficients of camber, etc., for its different parts, are plotted in diagrams on special cross-section paper.

In determining the blade area the principal consideration is that it shall be sufficient to keep the percentage of "slip" within the limits of good practice at all points, and the width is apportioned in a manner to give a fair distribution of work over the principal portions of the blade. The varying gliding angles are arranged to take advantage of the inflow of air from the periphery and give it a sternward flow with the smallest amount of disturbance. The co-efficients of camber (percentage of curvature) for the principal portion of the blade are derived from a consideration of the width, gliding angle and velocity of each point—the elements of width and angle increasing the coefficient and the velocity reducing it.

The diagrams of these varying features are of great interest, showing as they do, at a glance, all the different properties of the blade under its working conditions and making possible the very ready comparison of different designs.

Nearly all of the "Paragon" propellers have been designed in accordance with the principles already indicated with a view to their operation in actual flight, rather than their capacity to produce phenomenal thrust, although they seem to possess this capacity in greater degree than others. A few designs, however, have been gotten up for helicopter work, in which, of course, the standing thrust alone is the object sought. These designs proceed from a very different method of calculation and are not adapted to keep up their thrust at any considerable axial speed. We are not able at this time to give full particulars concerning tests of these helicopter designs but we

(*Continued on page 118*)

THE MAKE-UP OF A BIRD'S WING

By Dr. A. S. Rowe.

HAVING made a study of bird flight for years, I have been much interested in the article published in your esteemed AERONAUTICS, written by Prof. H. La V. Twining, of Los Angeles, entitled: "Can Man Fly With Wings."

These articles show a great deal of deep thought and close investigation into the science of bird flight, but have brought Prof. Twining to conclusions the reverse from those proved out by my investigations and experiments, i. e., that the air does pass through the feathers of a bird's wings on the up or forward stroke, and if you will kindly allow me space in the columns of AERONAUTICS, I will endeavor to give the experiments which led me to this conclusion; not for argument's sake but for the benefit it may be towards solving the problems of the science of aerial flight.

In the August number of AERONAUTICS, Prof. Twining, discussing the action of the up and down stroke of a bird's wings, says: "Much speculation has been indulged in as to the feathers opening on the upstroke to let the air through. Just a little intelligent observation of an extended wing will show how utterly fallacious this assumption is: The feathers overlap so they shingle on top from the part near the body to the tip. On the underside they shingle the other way. In either case, as the air strikes the surface, the feathers bind together and present a solid surface to the air. The direction in which they shingle cannot make any difference in this respect. If we take up the wing and blow violently on top of it, holding the hand on the other side, no air will be felt coming through. If we blow against the under side the same result is obtained."

Now, in order to arrive at an intelligent conclusion regarding the stroke of a bird's wing, and the action of air upon it during the strokes, we must understand the following points.

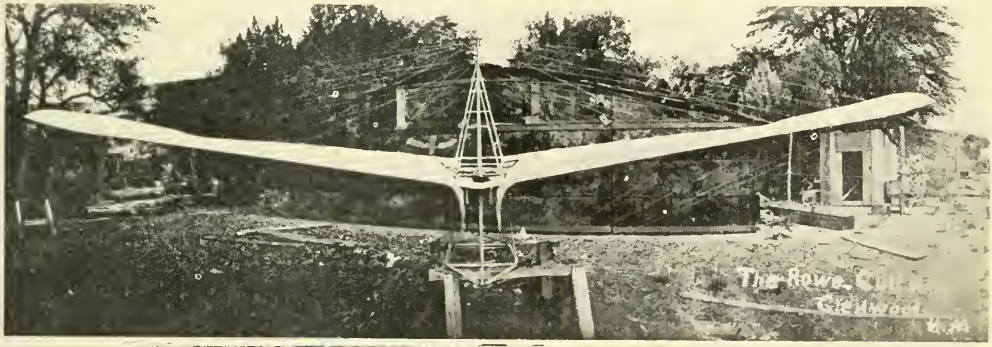
First.—The mechanical construction of the feathers. Taking the feathers of a turkey buzzard or pigeon's wing we find the barbs of nearly equal length on either side of the shaft near the body of the bird, and the barbs are of nearly the same flexibility on both sides of the shaft, those on the farther side being slightly the stiffer; but from near the body the barbs become longer on the inside of the shaft and shorter and stiffer on the opposite side of it with each successive feather, until in the feathers near the tip of the wing the shaft is nearly to the outer edge—thus forming a long valve, so to speak, with the shaft as an axis at one side.

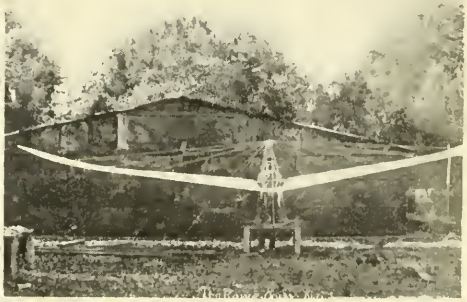
Second.—The position of the feathers in the wing. They are placed in the first third of the wing nearest the body of the bird, or out to the second joint, parallel with the body and at right angles to the front edge of the wing at their insertion, and their flat surfaces are nearly horizontal with the front edge of the wing; also when the wing is extended. From the second joint they diverge outward from a parallel line with the body until, in the buzzard's wing, when extended they attain a position nearly at right angle to the bird's body.

Third.—The relative position of one feather to another. The feathers lap or shingle nearly one-half their width out the first third of the length of the wing. The barbs on that side of the shaft of the feather nearest the body under the preceding one nearly their length. On the other two-thirds of the length of the wing they lap under relatively less as the feathers diverge from each other.

Fourth.—The relative proportions of the wing. Only about one-third of the length of a buzzard's or pigeon's wing is contained between the first two joints; the other two-thirds being made up from this point out. The feathers are much longer and wider in this section of the wing and the width of wing is about one-third its length.

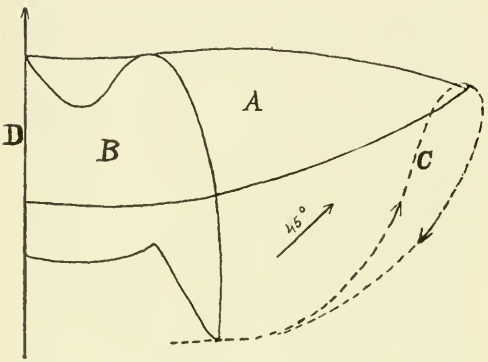
Fifth.—The direction of the stroke of a bird's wing in relation to its body. The stroke varies according to the results to be obtained; as when in starting on flight the wing is raised much higher above the body and is brought farther below it, and the flexion of the wing is much less





Three Views of the Rowe Glider

than when the bird is in free flight, but on the up or forward stroke it always moves upward and forward, and on the down stroke moves downwards and backwards; thus making a rotary movement on the whole. The tip of the wing traverses a cycle corresponding to a curved line drawn from the tip of the bird's tail to the tip of the wing when extended. (See sketch.) The wing is not thrust forwards and backwards extended, as though hinged at the bird's body, but is flexed at every joint including the one at the body, to a greater or less degree. From the second joint out is the area of greatest motion. The more rapid the flight the greater the flexion that takes place in the wing at each stroke. In every swift flight a pigeon closes its wing nearly against the body at each stroke. The action of the wing then is outward, upward and forward from the



body to the point of extension in the up or forward stroke, and the reverse in the downstroke, or downward, backward and inward towards the body. In the up stroke the front edge of the wing travels upward slightly farther than the rear edge, and the reverse on the down stroke. In normal straight-a-way flight the wing is elevated about as far above the horizontal line of flight in the forward stroke as it is brought below it in the down stroke.

Sixth.—The stroke of the wing relative to the line of flight. We see then that the forward stroke of the wing is made at an angle outwards from the line of flight something like forty-five degrees. The elevation and depression of the wing above and below the horizontal line of flight varies according to the lifting power required, increasing with the greater light.

Seventh.—The rapidity of the stroke of the wing in relation to the passing air. The bird's wing moving through the air on both the up and down stroke is always swifter than the motion of the air through which it is passing. Were this not the fact, a bird would be unable to rise from the ground and could not make headway against the wind.

Now, from the foregoing, understanding the mechanical construction of the feathers, their position in the wing, their relative position to each other, the relative proportions of the wing, the direction of the stroke in relation to the body of the bird, the stroke of the wing relative to the line of flight, and the rapidity of the stroke in relation to the passing air, we are enabled to make a test of the point in question, and will ttke up the experiment where Prof. Twining left off, by taking the bird's wing and directing a blast of air downward against it in direct opposition to the up or forward stroke, as described above, at the same time moving the wing toward the air current, the same as does the bird in flight. The air will be found to pass through freely between the feathers, and the air will pass in greatest volume through the outer two-thirds of the wing. On the down stroke, the feathers lapping under each other as they do, are pressed against each other, which prevents the air from passing through upward; but on the up or forward stroke this pressure is temporally released owing to the rapidity of the upward movement—this movement being much quicker than the current of air passing creates a slight pressure from above causing the long flexible underlapping barbs of the feathers to spring slightly downward admitting of the free passage of air between them. Birds, such as the quail, grouse, wild turkey and humming bird, which have a heavy body relative to the amount of sailing surface of their wings and who make their flight with a greater up and down stroke of the wings than do those having more sailing surface, will be found to have the feathers spread much farther apart in the outer two-thirds of the wings, the shafts of the feathers in this section being quite to the out edge, with the barbs underlapping much less, all of which is conducive to the free passage of air through the wing on the up stroke. And, too, another factor conducive to a free upward stroke of the wing, is the fact that the thrust is made in such a manner as to present the edges of the feathers, to a greater or less degree, toward the line of motion of the wing. This is accomplished to a great extent by the forward edge of the wing rising farther than the rear edge. There are several reasons that prevent us from being able to see the light between the feathers of a bird's wings when they make the up stroke in flight when passing above us. Three of the main reasons are: That the stroke is made most too quick for the human eye to catch it; the depression of the inner edge of the barbs of the feathers cause the feathers to assume more of a curve, the lower edge of one feather cutting off the line of light coming through the next; a portion of the bird's body and tail would obstruct the line of vision through the wing, owing to the angle of the wing in relation to the bird's body, and that of the position of the feathers in the wing.

Perhaps the failure of success of all the ornithopters built up to the present time is due to the fact that they only partially emulate the different movements of a bird's wing when it is in flight, as by the foregoing we can see that it would be a very difficult matter to make a machine that would be capable of obtaining the necessary movements essential to extensive flight; in fact, the complexity of such a machine would bar its usefulness. In Fig. 1, A is to represent an extended wing of a bird when in flight, B the flexed wing after the stroke, C the line traversed by the tip of the wing, if we were to look at it in the direction of the body during the stroke, should the bird's body not advance but remain stationary. When the bird's body is advancing in flight the tip of the wing describes a series of loops. D represents the line of flight, and the arrow the approximate angle of the stroke of the wing in relation to the line of flight.

In the glider built by Dr. Rowe it has been attempted to follow the shape of the bird, with the turkey buzzard as the pattern. The machine is 30 ft. 6 ins. spread, planes 8 ft. fore and aft, and the total length 15 ft. The weight is but 44 pounds. The depth of the curve of the planes is 7 ins. at the central section of the machine, this depth being at a point one-third back from front edge. This curve diminishes in depth until out 10 ft. toward their tips the planes are flat. From this point they curve upward to their ends as well as curving slightly upward toward the edges, in imitation of a buzzard's wing. The dihedral angle is in exact proportion. The perpendicular rudders curve downward in a position to take the place of the sides of the bird's body and extend the length of the planes with the exception of a space near the center of each, which gives room for the operator's arms. The situation of these rudders is designed to prevent the machine being turned around when going sideways to the wind. The bracing system makes the machine rigid at every point. After trials as a glider a power machine will be made of it.

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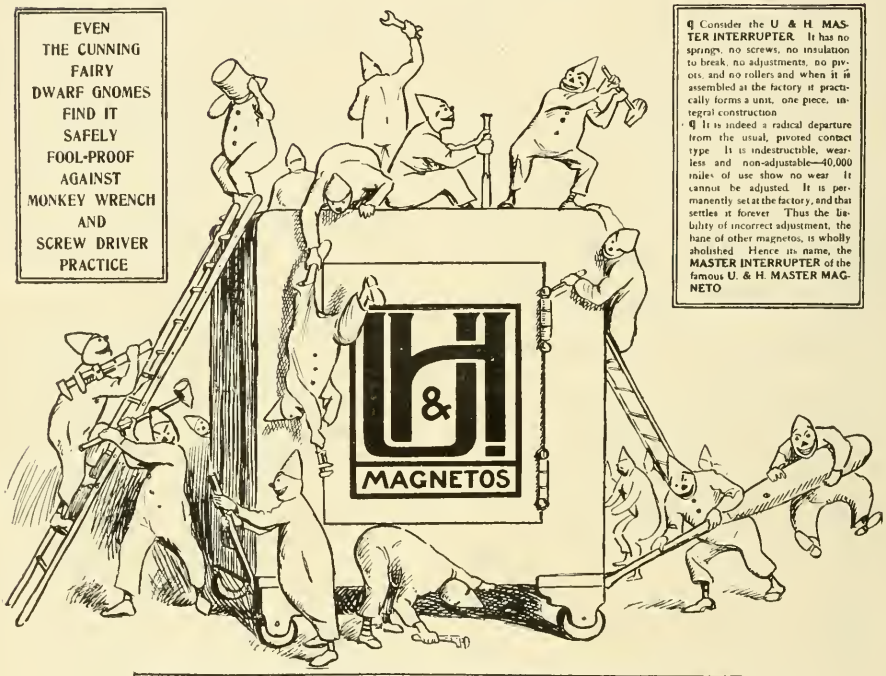

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IE OFFICIAL RECORD OF THE AVIATION MEET.

Boston—Charles J. Glidden, chairman of the contest committee of the Harvard-Boston Aviation Meet, has handed anager Adams D. Claflin a report of the events.

There were 14 trials for speed, 12 for altitude, 12 for getay, 10 accuracy, 2 "slow," and 170 bombs thrown. The oplanes in the contests were in the air 29 hours, 37 minutes l 7 2-5 seconds, travelling 631 miles and 3617 feet. To this be added the exhibition trials and practice, bringing the time he air up to 48 hours and the air miles travelled to 1000.

Of the above Grahame-White made 23 trials and dropped bombs; Johnstone 3 trials and 11 bombs; Brookins 8 trials l 47 bombs; Curtiss 10 trials and 19 bombs; Willard 6 trials l 13 bombs.

Of the hours of duration and distance traveled in contests credit to each aviator is as follows:

	Duration in minutes	Duration in miles
Grahame-White	612	232
Johnstone	754	330
Brookins	279	*20
Curtiss	60	26
Willard	70	21

*Brookins time was principally spent making altitude.

Of the exhibition trials and practice Grahame-White can redited with fully 80%.

During the meet three world's records were established,— uracy, (landing nearest a designated spot); "slow," (longest consumed three times around the course outside the pylons) getaway (shortest distan e run on ground before rising). Accuracy and "slow" were won by Wright biplane; getaby the Farman biplane.

HARVARD-BOSTON MEETING

RECORDS OF THE MEET.

Speed—3 laps (5¼ miles) in 6 min. 1 sec., by Grahame-White (Bleriot).

Altitude—4,732 ft. in one flight by Brookins (Wright).

Duration—3 hrs. 5 min. 40 sec. in air during one flight by Johnstone (American record), in Wright machine.

Distance—101 miles 389 ft. in one flight by Johnstone (American record).

Getaway—26 ft. 11 in. from start by Grahame-White, facing a stiff breeze.

Accuracy—Stopped 5 ft. 4 in. from centre after landing within 100 ft. circle by Johnstone (world's record).

Slow Lap—3 laps (5¼ miles) in 13 min. 48 sec. (22.82 m. p. h. Ogilvie held previous record of 24.11 m. p. h. in a Wright machine), by Brookins (world's record).

Bomb-Dropping—180 points on 81 hits at battleship by Grahame-White, 100 ft. altitude.

Boston Light Course—34 min. 11-5 sec. over 33 miles of water by Grahame-White.

Amateur Events—Clifford B. Harmon won the Harvard cup for bomb throwing, and the cups for speed, duration and slow time for three laps. His only rival, W. Starling Burgess, was awarded second place for duration.

PRIZE MONEY DIVISION.

The prize money was divided as follows:

Grahame-White—		
Boston Light Flight	$10,000	
Bomb Throwing	5,000	
Speed, 1st prize	3,000	
Altitude, 2nd prize	2,000	
Duration, 2nd prize	1,000	
Distance, 2nd prize	1,000	
Getaway, 1st prize	100	
	$22,100	
Contract price for entry	7,500	
Total		$29,600
Johnstone—		
Duration, 1st prize	$ 2,000	
Distance, 1st prize	2,000	
Accuracy, 1st prize	500	
Slow Lap, 2nd prize	500	
	$ 5,000	
Brookins—		
Altitude, 1st prize	$ 3,000	
Accuracy, 2nd prize	250	
Slow Lap, 1st prize	1,000	
	$ 4,250	
Contract price for entry of both	30,000	
Total for Wright Aviators		$39,250
Getaway, 2nd prize	$ 500	
Willard—		
Contract price for entry	4,000	
	$ 4,500	
Curtiss—		
Speed, 2nd prize	$ 2,000	
Contract price for entry	10,000	
	$12,000	
Total for Curtiss Aviators		$16,500
Roe—		
Contract price for entry		7,500
Total prize and contract money for professionals		$93,850

THE first event of its kind and the largest aero meeting yet held in America was that organized by the Harvard Aeronautical Society. Its official duration was from September 3-13, though flights were continued September 14-16.

The financial success of the aviation meet is not known officially.

Unofficially it was claimed there had been deposited in the bank $126,000 receipts for the meet. The expenditures have been about as much. Paid admissions totaled 67,241 for 11 days.

There was too much red tape in connection with the affair. Aviators found it more difficult to get to their machines than the public found it easy. Newspaper men were not treated very well, it is claimed. To get in one a reporter had to have a press badge good any place, one good somewhere, one not good anywhere, a grandstand ticket, a few ribbons and a health certificate.

Grahame-White did very well financially, outside of the prizes. He took up many passengers, and for each flight, it is unkindly rumored, his manager collected $500—in advance.

LAST TWO DAYS.

Boston, Sept. 16.—Claude Grahame-White, the English aviator, defeated Glenn H. Curtiss in a special race at Squantum yesterday, thus bringing to a close the meet which has been on since September 3.

The Englishman not only won over the American champion by a good margin, but he made better time for the distance of five and one-quarter miles than he did last Tuesday when he scurried around the course three times in 6 minutes and 1 second. Yesterday he traveled an equal distance, or three times around the 1¾ mile course, in 5 minutes 47 4-5 seconds, while Curtiss made the distance in 6 minutes 4 3-5 seconds.

Grahame-White's time for the first lap was 1 minute 56 2-5 seconds; for two laps, 3 minutes 3-5 seconds; for three laps, 5 minutes 47 4-5 seconds. The time of Curtiss for the first lap was 2 minutes 4 1-5 seconds; for two laps, 4 minutes 4 4-5 seconds; for three laps, 6 minutes 4 3-5 seconds.

By Greely S. Curtis.

In spite of many discouragements and by persevering effort James V. Martin, a special student at Harvard University and the director of the Harvard Aeronautical Society, succeeded in obtaining the co-operation first of President Lowell of Harvard and then of Mayor Fitzgerald of Boston, and subsequently several Boston business men. The idea took root and soon an experienced manager was found in the person of Adams D. Claflin.

All the aviators except Grahame-White were housed in two long canvas tents on opposite sides of the principal company street. The tents were 500 feet long by 50 feet wide and were adequate for their purpose.

One tent housed the following machines: Hubbard monoplane, Curtiss biplane, C. B. Harmon's Farman biplane, two Wright biplanes, fire apparatus, Gaines' Clement-Bayard-Santos-Dumont-Demoiselle and the Harvard biplane. In the south hangar were the Bleriot monoplane and Farman biplane of Grahame-White adjacent to the two triplanes of A. V. Roe. Next came the high powered Burgess biplane operated by William Hilliard and two more Burgess biplanes, Models B and C entered by the Burgess Company and Curtis. Next were the Curtiss biplanes, one owned by Augustus Post and the other operated by Charles F. Willard. Beyond these were housed the kites exhibited by Mr. Perkins. The Pfitzner monoplane and the Dixon dirigible were established in separate tents, provided by their owners. An A. V. Roe triplane has been purchased by the Harvard Aeronautical Society.

Perkins' Man Kite

THE FIELD.

The choice of grounds fell upon the marshland at Squantum, lying just across the Neponset River from the southeastern limits of the city of Boston. The grounds are in the form of an island; a narrow salt water creek separates it from the mainland and is bridged by a single road. While most of the island is low-lying marsh, soft and soggy even in character, there are two strips of firmer ground, perhaps seven or eight feet above the level of high tides. One of these strips was assigned to the grandstand while on the other the hangars and sheds were located.

The flying field lay to the west and north of the grandstand and included an area of irregular shape with a circumference of approximately two miles. The pylons were arranged for a circuit of one mile and three-quarters. While the field is probably the best available in the close vicinity of Boston and is adequate for the work of professionals, it is not ideal for amateur aviators under existing conditions. The space assigned for starting in front of the grandstand sloped slightly uphill and remained rough in spots in spite of the admirable work devoted to its improvement. Then the layout of the course required a turn to the left soon after starting in order to avoid the waters of Boston Harbor. Unfortunately just to the left and a few hundred yards beyond the starting line, there was a deep gully in the marsh to trap the inexpert. It was this gully which brought the noted amateur, Clifford B. Harmon, to grief on the opening day and kept him from further participation till near the end of the meet.

PROGRESS OF THE MEET.

On Saturday, September 3, the meet opened in threatening weather with a crowd of only moderate size in attendance. Grahame-White started on his victorious career by setting a good mark in the speed event as well as by establishing an excellent average in the bomb throwing, scoring 21 points in 10 shots. The American professionals, Curtiss, Willard, Brookins and Johnstone followed White into the air and gave exhibitions of plain flying without attempting any sensational maneuvers. By winning the duration and distance events on the first day Johnstone laid the foundation for his final success in these two events.

On Monday the interest was increased by the first passenger carrying, Grahame-White and Willard each taking up a lady passenger.

On Monday and Tuesday, Mr. Grahame-White continued to increase his lead in spite of the rain and foggy weather, which prevailed, so that on Tuesday evening when the meet was one-third through he led the field with a total of 14.9 points against a total of 15 8-17 points for Johnstone, Willard, Curtiss and Brookins combined. By Tuesday White led in every event except for distance, and in that he was only a single point behind Johnstone. Brookins did sensational stunts. The best records for the three first days were as follows:

Speed—Grahame-White, 6 minutes 1 seconds for 5¼ miles.

Duration—Johnstone, 1 hour 20 minutes 12 seconds.

Distance—Grahame-White, 45 miles 617 feet.

Get-away—Grahame-White, 66 feet 10 inches.

Bomb-dropping—Grahame-White, 20 trials, 56 points.

The system of scoring points was a novel one and well arranged to develop constant competition in all the events. Three points were awarded to the winner each day in each event, provided at least three entries were registered in that event. Two points were given for second place and one point for third place. In case less than three entries were made on any day, the winner received two points and the second man one point. The events in which points were to be earned were speed, altitude, duration and distance. In addition it was at first arranged to add the score made each day in the bomb-throwing, but this was subsequently changed so that only the average score per bomb thrown was added to the points won in the four events above mentioned. Each bomb hitting the deck of a full sized outline of a battleship from the height of 100 feet or more counted one point, while two funnels formed the bullseyes of the target, and a shot in them counted five.

By Friday evening, September 9, when six of the nine days had been completed, Grahame-White had still further increased his lead. His score by points had totaled 33.2 against 17 for Johnstone, his nearest rival. Brookins had scored 10 points, while Curtiss and Willard were tied at 8.

In the last half of the meet, however, the Wright operators started in consistently to earn points in altitude, duration and distance. Brookins earned 5 first places in altitude in the last 5 days, while Johnstone accumulated 17 points in the duration and distance events.

The final scores by points were as follows:

	Speed	Altitude	Duration	Distance	Bomb Average	Total
Grahame-White	15	12	11	8.5	2.2	48.7
Johnstone	..	2	13	13.	2.2	29.8
Brookins	..	15	2	1.	1.9	19.9
Curtiss	11	..	..	0.5	1.4	12.9
Willard	8	..	..	..	1.0	9.0

This score indicates that White had won first place in speed on five days; first place in altitude on one day; first place in duration three times; in distance three times and had scored more than two points on every bomb thrown. Johnstone scored five wins in duration and five in distance. Brookins on five days made the best flight for height. Curtiss gained the speed prize on one day

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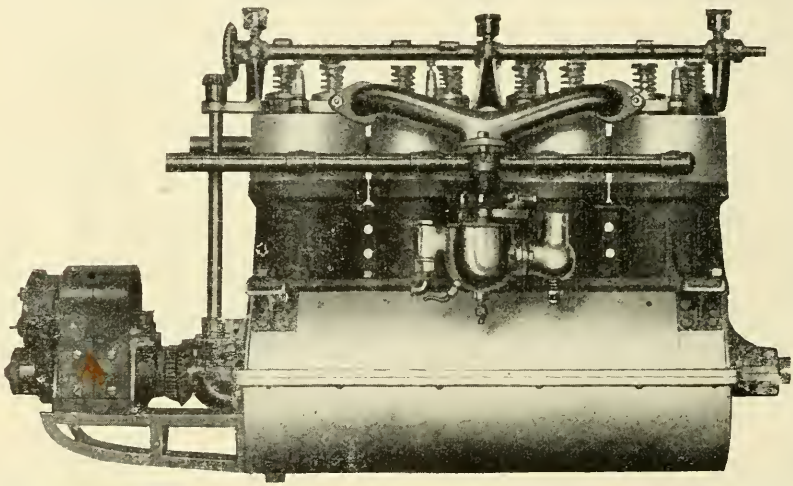

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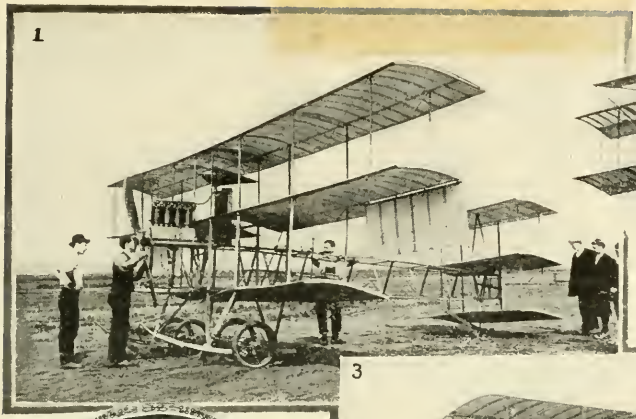
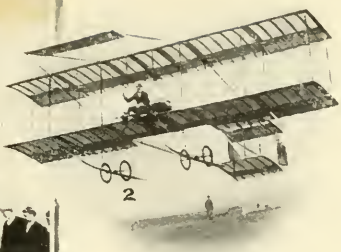
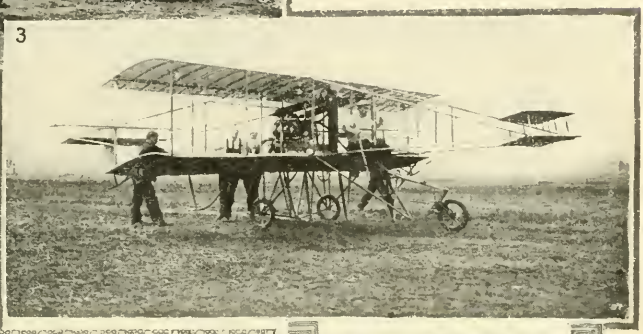
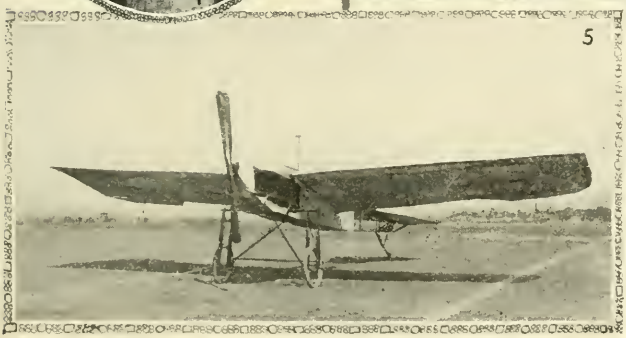
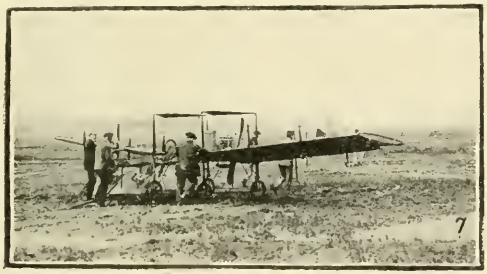










Photos by EDWIN LEVICK, N.Y.

1—A. V. Roe Triplane. 2—Grahame-White in His Farman. 3—Hilliard in the Burgess-Curtis.
4—Claude Grahame-White. 5—G. G. Hubbard Monoplane. 6—Walter R. Brookins.
7—Pfitzner Monoplane. 8—Glenn H. Curtiss Flying New Machine.
9—Brookins Beginning a Sharp Turn.

and was second in that event on four other days. Willard won first in speed once.

The special feature of the meet was the $10,000 prize offered by the Boston Globe for a two-lap flight around Boston Light and return. The course called for distance of approximately 33 miles, almost all of which was over the water of Boston Harbor. Grahame-White made his first attempt in his Bleriot monoplane on the fourth day of the meet and covered the course in 40 minutes 13-5 seconds. This relatively slow time was in part due to a detour caused by the aviator's lack of familiarity with the landmarks. On the next to the last day of the meet, White made a second trial with the same monoplane and cut his time for the 33 miles down to 34 minutes. Making a fair allowance for the distance lost in the half dozen turns required, his average speed must have been over 60 miles an hour.

The only hope of defeating Grahame-White for the Globe prize lay in Glenn Curtiss' speedy flyer. The early days of the meet, however, had shown that the Bleriot with its 50 h. p. Gnome motor was faster than the Curtiss machine with its 50 h. p. 8-cylinder Curtiss engine. Curtiss had to look for a more powerful motor. This he found in the new Indian motor rated at 60 to 65 h. p. power which was owned by the Burgess Company & Curtis. An arrangement was quickly made to transfer this motor from the Burgess biplane flown by William Hilliard to the Curtiss flyer, and it was installed during the intermission of Sunday, September 11. Unfortunately there had been no time to test out the new motor and when Curtiss attempted to fly with it, unexpected carbureer troubles developed which were remedied only after two days of constant tinkering. The motor finally was put in running order on the last official day of the meet, and he was enabled to overtake Grahame-White in his speedy Bleriot. But unfortunately the delay proved fatal to Mr. Curtiss' chances for the Boston Globe prize, as the time limit expired before the motor was finally turned up. The Indian engine gave 430 pounds thrust on a spring balance attached to the Burgess machine.

Among the amateurs the most notable event was the accident to Harmon's biplane shortly after making a start on the opening day of the meet. The accident was in part due to the soggy condition of the grounds after the continuous rains. Harmon was unable to get up his usual speed before taking off, so that his machine was traveling at a comparatively slow rate when it reached the first turn. The act of turning brought one wing tip in contact with the ground, and the whole biplane was precipitated into a gully across the course, which wrecked both supporting surfaces, smashed the propeller and injured the motor itself. The running gear of the machine also was wrecked so that it seemed hopeless to attempt to replace it. However, W. Starling Burgess, a fellow competitor, placed the facilities of his Marblehead factory at Harmon's disposal and returned the biplane to its owner in better condition than ever several days before the end of the meet. Harmon, however, borrowed Mr. Grahame-White's Farman biplane and succeeded thereby in winning first prize for amateurs in speed, duration, bomb throwing and slow lap.

Second prize among the amateurs was won by W. Starling Burgess in a Burgess biplane. The other amateur entries included William Hilliard in a Burgess biplane, who made two or three circuits of the course, but did not officially compete because his powerful 60 h. p. motor had not been properly tuned up before it was loaned to Mr. Glenn Curtiss. A. V. Roe, in his English triplane, and H. F. Kearny in the Pfitzner monoplane, both met with disaster on landing after short flights. The only other amateur aviator, Augustus Post, made some short straight-away flights in his Curtiss biplane, but did not enter officially for any of the prizes.

The meet was attended by many officers of the Army and Navy, as well as a large number of persons socially prominent. President Taft was a center of attraction one day and on other occasions Governor Draper of Massachusetts with his staff and the mayor of Boston added a political touch to the gathering. Thanks to Grahame-White, Mayor Fitzgerald went up in the air to a greater height than he had previously experienced.

The success of the meet as a whole is a monument to the initiative of James V. Martin, to the ability and perseverance of Manager Claflin and the able committees in charge.

Perkins' Man-Carrying Kite.

So far as known, the first time that a man has been taken up by kites for the purpose of exhibition in this country was at the Boston meet, and this stunt is now the feature of the kite exhibitions which Samuel F. Perkins has been booking at all the meets.

A series of monster kites are used, from 9 to 18 ft. tall. Up to fifteen kites are employed, according to the velocity of the wind and the weight of the man. It has been found that a man can be lifted in a wind as low as 16 miles an hour. An 18-ft. kite is first started and sent up for about a thousand feet, or until it reaches a steady current of air. Then a number of the 12-ft. kites are put on the line, spaced about 100 ft. apart. These are added to as desired until the pull is found to be great enough to carry a man.

At Boston Perkins himself went up about 125 ft. on a little wooden seat slung by ropes, as shown in the picture. The rope used to hold the kites is one-half inch in size and of the best grade that can be bought. The reel has to be very strong and well anchored. Miss Emily Willard, a sister of Aviator Willard, also went up in the kite.

Kites have been used to some extent abroad for military measures. Not long ago experiments were made in England. It is alleged that the United States Army tried man-lifting kites some years ago, and Lieut. Wise actually went up a little way, but further investigations in this direction are said to have been given up. It will be remembered that the late Lieut. Thomas E. Selfridge, in 1908, was carried up in a monster tetrahedral kite made by Dr. Alexander Graham Bell, but on this occasion the kite was towed in the air above the waters of Bras d'Or Lake, by a power boat.

Perkins has been sort of a stand-by at all the exhibitions that have been held thus far, as his kites provided something for the crowds to watch at all times, if there was any wind at all, and as those who have had the more or less pleasant experience of visiting some of the flight exhibitions that have been held, know, a great deal of the time there is nothing but the kites to watch with the wind blowing too strong for the birdmen to do any "birding."

PROPELLER DESIGN

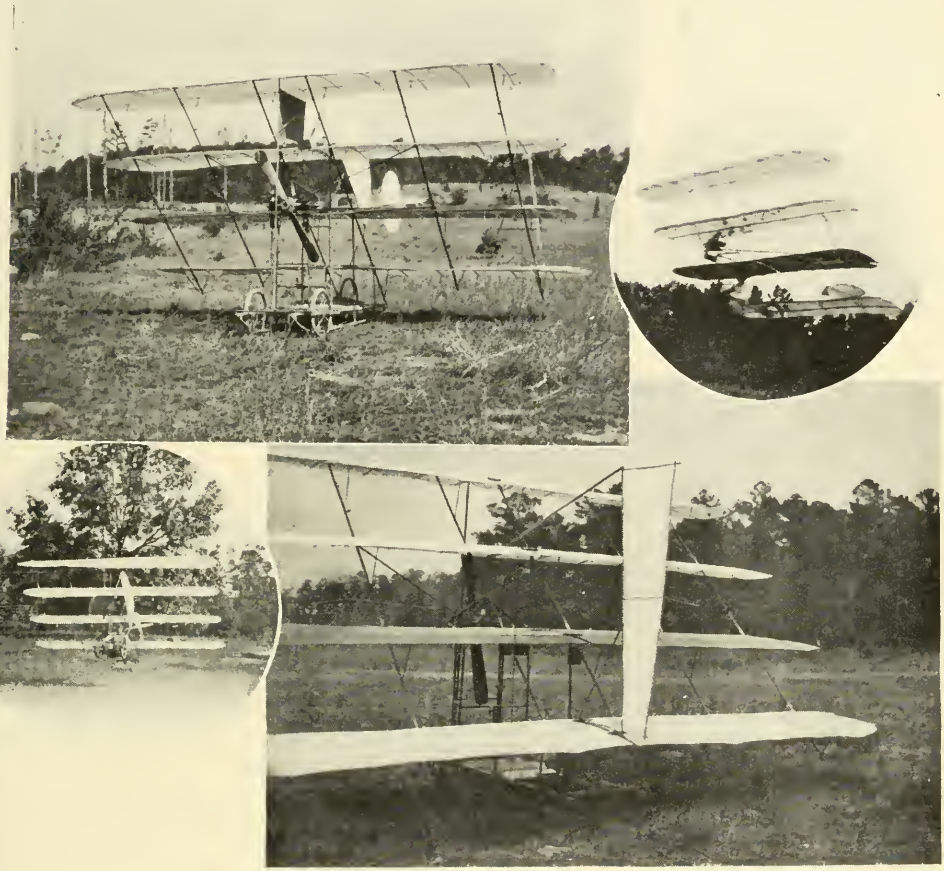
[*Concluded from page 112*]

have creditable reports that one pair of them recently tried strained very heavily at their moorings while lifting a weight of 780 pounds. They were driven by an engine rated at 50 to 60 h. p., but probably giving very much less during the test as it was running at only about 450 to 500 r.p.m.

In regard to details of construction, the usual number of laminations is five, but four are used in the smaller sizes and sometimes six for the largest ones. The plan form for each lamination is accurately designed and each pair for opposite blades of the same propeller are sawed out together in duplicate to exact pattern and the holes for the dowels located by templates so that the registration of these holes makes it impossible to put the several pieces together in any but their correct relation. The corresponding pieces in opposing blades are selected from adjacent parts of the same edge-grained board, thus insuring the utmost similarity of weight, grain and texture in the corresponding portions of the blades. The accompanying illustration shows a group of half laminations for a 2-bladed propeller ready to be assembled and glued.

As for the best material, we have tried many varieties of wood but have found nothing really superior to carefully selected edge-grain spruce, although we find quartered white oak, hickory and other hard woods very excellent, beautiful and durable for the smaller sizes in which a little more weight is desired or not objected to.

FLIGHT PROGRESS OVER THE COUNTRY



Curtiss Flies 129½ Miles Over Water.

On August 31st, Glenn H. Curtiss flew in his 8-cylinder machine from Euclid Beach, just east of Cleveland, to Cedar Point, near Sandusky, Ohio, air line distance of 60.5 miles in 1 hour and 18 minutes. The distance is about equal to that between Poughkeepsie and the upper end of Manhattan Island, which was one stage of Curtiss' trip from Albany to New York. The wind velocity was 12 miles per hour.

The U. S. Hydrographic Office at Cleveland figured the actual distance traveled one way as 64¾ miles. This gives a speed of 49.8 miles per hour on the outward trip.

BEATS PIGEONS ON HOME TRIP.

On September 1 the return was made but in much slower time, 1 hour and 41 minutes being consumed. The return was made, for part of the distance, in the rain, which stung the aviator's face. Some homing pigeons which were released at Cedar Point took 2 hours and 54 minutes to make the trip.

Euclid Beach and Cedar Point are amusement resorts. The flight was made possible by the Cleveland *Press*, which gave a prize of $5,000.

Flying With Four Horsepower.

We give some photos of aeroplane experiments of M. B. Sellers in Kentucky. One of the pictures shows a rear view of the machine with a vertical rudder which can be made to assume a screw shape as described in article on Lateral Stability in May, 1910, AERONAUTICS. This was used long enough to prove the correctness of the principle. Note the keel, rudder and equilibrium plane as originally designed and now used. The other pictures show machine in flight. In these flights the Dutheil & Chalmers opposed engine was used. Six ¼ in. auxiliary exhaust holes were bored in each cylinder, increasing the h. p. about 15 per cent. The brake h. p. before boring holes was about four. An Elbridge 2 cyl. 10 h. p. special motor has been ordered.

Harmon's Flight Across L. I. Sound.

Clifford B. Harmon made his long promised flight across Long Island Sound on August 20. He started from the aviation field at Mineola about 6:30 o'clock. Thirty minutes later he landed in Greenwich, Conn., in a field next to the estate of his father-in-law, Commodore E. C. Benedict, an airline distance of 19½ miles.

Mr. Harmon was unhurt, but his Farman machine was damaged. The flight won for Mr. Harmon the trophy offered by *Country Life in America* for the first successful aeroplane flight across the Sound. Before starting on his trip across the Sound he made a flight with Charles K. Hamilton as passenger to test out his machine and to study the air conditions.

After making several laps he landed and announced that he would start out to win the trophy. The wind was blowing about fifteen miles an hour. In the flight to Roslyn, where he reached the water, the flying was over bad country. It was a struggle to keep right side up crossing Hempstead Bay, but he reached the Larchmont Yacht Club in safety and turned over the vessels in the harbor there at the international motor boat meet. From here he flew up the Sound to the island just in front of his father-in-law's estate, landing on a sandy beach just across an inlet, and came down in tall grass, after fouling some telephone wires. That accounts for the wrecked machine.

Novice Flies 28 Miles Cross Country.

William Evans, of 817A East 15th street, Kansas City, Mo., was able to fly 28 miles across country on his second day's experiment with the 30-foot Greene biplane fitted with an Elbridge four-cylinder engine. The first day he received the machine he made several flights back and forth the length of the half-mile field, with a propeller which was not designed to give a great deal of thrust. The next day he changed the propeller and made his 28-mile flight across country. Gliding down, he could not pick his landing and broke the front control. Percy Haslett, of Alameda, Cal., and a man named Jones, of Tombstone, Ariz., which latter ought to be a good place for aviators, have bought Elbridge engines, so there must be something doing.

The Greene aeroplane which Roy Crosby, of San Francisco, bought has now been taken over by the California Aero & Supply Co.

The Latest Wright Model.

At the Asbury Park meet the first public test was made of the new long distance Wright. The machine is very similar to the standard type, with the rear horizontal surface; practically the only change being in the fact that the horizontal rudder in front is left off. In the place of this, the warpable horizontal tail serves to control the motion up and down. The advantage of this arrangement is that there is nothing in the forepart of the machine to be caught by sudden puffs of wind. As heretofore constructed, wind striking the front horizontal rudder acted with a powerful leverage on the machine, due to the distance of the rudder in advance of the main planes. No such effect is experienced with the horizontal rudder at the rear of the apparatus.

The forward small vertical planes have been preserved in the new machine and are mounted in the framework of the skids. This rear horizontal surface is rigidly guyed to the outriggers for the forward third of its length fore and aft. From one-third back it is flexible and warped up or down, for steering up or down respectively, by crossed wires from the usual lever.

The planes spread 39 ft. (the older machines were 41 ft. and the government flyer was 36 ft.). The engine has greater bore than usual, being 4⅜ by 4. The weight is around 800 pounds.

Wheels, flexibly mounted, are fitted to this machine, as well as to some of the other machines.

The machine is faster and can carry more weight. It has not, however, the quickness of action that the others have, and is not quite so well adapted for cutting fancy figures, though to the layman there seems to be no difference.

Constant Flying at Dayton.

There is almost constant flying at the Dayton camp, which is proving of great interest to all who have the opportunity of seeing it. P. O. Parmelee is a new Wright aviator. The Wright company has purchased a section of land in the west end of the city, and on the 7th instant broke ground for a group of buildings which are to form the new factory. A double force of men are now on the first building, containing 14,000 sq. ft. of floor space which is to be used as the assembling room of planes and frames. The factory plan is of course of the most improved type, constructed of steel, brick and cement.

Harmon Changes His Farman.

Clifford B. Harmon's Farman machine, which was badly wrecked at Boston on the opening day of the meet, was repaired in record time and altered so as to make shipping and repairs less troublesome than heretofore.

While the original dimensions and curvatures of the Farman biplane were retained, the wings were changed so that they are detachable from the central body in much the same manner as the Burgess-Curtiss biplanes are arranged. The surfaces can thus be packed in a space 12 ft. long, instead of requiring 35 ft. of space as before.

The alteration was made by the Burgess Co. & Curtis. By rushing the force on September 4th and 5th, it was possible to ship the new planes complete on September 8th, the time required having been four working days. The job was undertaken on a Saturday night, and there was no opportunity to obtain materials or outside assistance owing to the approaching Sunday and holiday. The men also had been given a vacation, with opportunities to attend the Harvard meet, as reward for several weeks of strenuous work. It thus became necessary to recall the force as far as possible by telegraph and engage Messrs. Wilson & Silsby, the Boston sailmakers, to work overtime preparing the cloth for the surfaces.

Latest Curtiss Change.

The Curtiss aeroplane used at the Boston-Harvard aviation meet by Glenn H. Curtiss presented a changed appearance from the machine formerly used by him.

Although the same engine was used as in his Hudson Flier the machine was altered to give it more speed and cut down head resistance.

The following changes were noticeable in the Curtiss machine:

Camber of planes slightly less than in old style. Same surface as in Hudson-Fulton flyer. Ailerons, four, forming rear of outer sections of upper and lower planes, working upward and downward and not down only as in Farman machine; less head resistance because behind planes; normal position downward toward rear in line with rear of planes which brings them parallel to current of air passing over and under plane surfaces; front control is a single surface, with diamond-shaped vertical plane set stationary half above and half below. Same controls otherwise and same chassis. Outer sections of wings covered both sides. Middle sections covered one side.

Woman to Fly Curtiss Machine.

Miss Blanche Scott, the young lady who recently completed a trans-continental trip in an automobile and was a passenger in a flight with C. F. Walsh in California, is expected to make her debut at flying a Curtiss machine during the exhibition flights in Chicago, preliminary to the start of the Chicago-New York race.

New Design Biplane.

A new type of biplanes is being experimented with by James B. Slinn, of Chillicothe, Ill., in which the forward control is done away with, using the upper plane for this purpose. The lower plane is of less spread than the upper and shorter fore and aft. The upper plane spreads 27 ft. by 5½ ft., and the under one 15 ft. by 3 ft. Allowing for material cut away for propeller the supporting surface totals about 160. The rudder is 3 ft. by 4 ft. Weight without pilot 340 pounds. The machine is mounted on a 3-wheeled chassis. Materials, spruce and bamboo. An engine of own make will drive a 6 ft. propeller placed in the rear.

A man named Cooley is building in Rochester a monster monoplane of 80-ft. spread. It resembles nothing that has yet appeared in the aerial world. Two Elbridge engines drive two propellers.

The Curtiss exhibition company now has a Curtiss machine traveling as a "dead exhibit" around the country to fairs and wherever there are no facilities for flight. Moving pictures are shown and a lecture given by Carl H. Carson.

Satisfied with Elbridge Engines?

RECENT flights have been made with Elbridge *"Featherweight"* Engines by Dr. Wm. M. Greene, at Rochester; by Captain Bumbaugh, at Indianapolis; Edward R. Skinner, South Beach, aten Island; J. W. McCallum, Kansas City, Mo., and many others.

o one ever complained that an Elbridge Engine lacked power or speed. Not only do they represent ore actual horse-power for weight than any others on the market, but broken parts are practically heard of. You need never descend for "lack of power" if you use Elbridge Engines.

The Greene Company

MANUFACTURERS OF THE GREENE AEROPLANES

Rochester, N. Y., June 30, 1910

To the ELBRIDGE MACHINE COMPANY, Culver Road, Rochester, N. Y.

Gentlemen:—I wish to express my admiration for the performance of the 40-60 "Featherweight" engine used by me yesterday in the trial flight at the grounds of the Aero Club of Rochester.

My machine was driven through he air at a rate of speed I had by no means anticipated. The effect on my nerves of this feeling of speed and reserve power I can compare only to the exhilaration produced by a strong cocktail.

I have used several different motors in my other machines, and to-day I am more than ever convinced that the Elbridge "Featherweight" is the ONLY real flying machine engine on the American market.

Cordially yours, (Signed) WM. GREENE.

Profit by e Experience of Others

It is expensive and dangerous to experiment with Aeronautic Motors unless they have demonstrated their efficiency in actual service. The Elbridge "Featherweight" has made good.

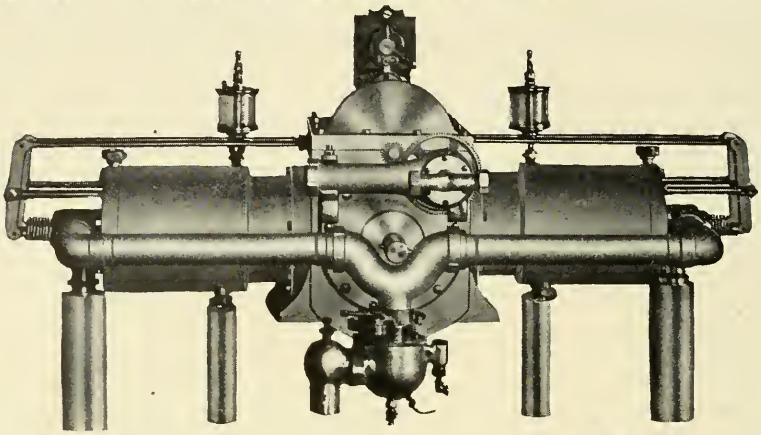
The Best is Always the Cheapest in the End

atalogue and prices for asking; our information bureau is at your service

LBRIDGE ENGINE COMPANY

Aero Dept." - - - - - **Rochester, N. Y.**

FACTS ABOUT MOTORS



The Call Aviation Engine

IS

1st. A Four Cycle Engine. The type used on 99% of all automobiles and motorcyles. The type used by all prominent aviators here and abroad, and holding all aviation records.

2nd. A Water Cooled Engine. The only kind that can be depended upon for extended runs without danger of overheating. Our spiral water jacket, together with piston pump circulation is the most perfect cooling system yet devised.

3rd. An Opposed Cylinder Engine. The construction conceded by gas engine authorities to be the nearest vibrationless type. By all odds the construction best adapted for aviation purposes.

4th. A Silent Engine. The only engine yet designed for aviation having both main and auxiliary ports silenced. Hence the only aviation engine adapted for permanent use, or for other than merely exhibition purposes.

5th. A "Fool-Proof" Engine. The utmost simplicity of construction, small number of cylinders, together with its being of the usual Four Cycle type, enables any automobile chauffeur to set and run it, not one in fifty of whom have any experience with Two Cycle, Revolving Cylinder, or V-shaped multiple cylinder engines.

6th. A Thoroughly Dependable Engine. Our Magnalium outer casing for cylinders and cylinder heads permits of a remarkably strong construction with minimum weight; while our Vanadium Grey Iron Cylinder and cylinder head linings, piston heads, valve cages, valve seats, etc., is the only dependable material for these parts.

7th. A Superbly Beautiful Engine. The entire design is thoroughly artistic; while all exposed parts not constructed of Magnalium—a shining non-corrodible metal—are nickel plated, the whole surface being polished to a mirror finish.

8th. A Phenomenally Powerful Engine. This result is secured by the use of a comparatively small number of cylinders of generous proportions, as distinguished from a multiplicity of cylinders with their numerous parts and bearings, and consequent friction, and liability to derangement.

9th. An Exceptionally Economical Engine. It is a matter of common notoriety among gas engineers that economy of fuel, as compared with power developed, is secured by large cylinders, few in number, rather than by a multiplicity of small cylinders—a consideration of paramount importance in aviation.

10th. A Moderate Priced Engine. While the material and workmanship of this engine are even superior to the very expensive foreign makes, and not to be classed with the cheap engines flooding the market, yet our aim has been to furnish aviators with a moderate priced engine, cheaper than could be produced by themselves, except in large numbers, and with an expensive shop and foundry equipment.

Other Aviation Engines possess a few of these advantages. This is the only engine that combines them all.

MODEL E-1: Two Cylinder; 50 Horsepower, weight, 150 lbs. - Price $1,000
MODEL E-2: Four Cylinder; 100 Horsepower, weight, 250 lbs. - Price $2,000

Prices include complete equipment, NO EXTRAS

Delivery 30 days: Terms, 35% Cash, with order; Balance sight draft against Bill of Lading

WRITE for particulars and price of our REVERSIBLE AERIAL PROPELLER

Also of our **COMBINATION RADIATOR AND HEATER**, constructed of aluminum tubing. Utilize the heat of your engine for the comfort of your passengers. Weight, 1½ lbs. per gallon of jacket water.

SEND FOR CATALOGUE C-2

THE AERIAL NAVIGATION COMPANY OF AMERICA, Girard, Kansas

New Greene Aeroplane.

A biplane built by Dr. William Greene especially for cross country flying and long distance racing is now ready. It is of the same general style as other Greene machines, such as already described in detail in AERONAUTICS. It has a spread of 30 ft. with a chord of 7½ ft. and a curve depth of 2⅞ in. A six-cylinder Elbridge engine is installed which actually gives on a Prony brake test 61½ h. p.

Two sizes of Greene machines are now being marketed with prompt deliveries, 30 and 37 ft. spread respectively. All the Greene machines are supplied with Elbridge engines and the Farman type landing arrangement, 20-in. wheels, 3-in. Palmer tires, Bosch magneto and El Arco radiators. On the large machines the wheels are 24 in. in diameter. What are called "practice skids" are being used in trial flights. These are fastened to the regular skids, as shown in the photograph. The large machine has a chord of 6 ft. 7½ in. and a depth of curve of 4¼ in. The ailerons, 10½ ft. by 29 in., are attached to the rear struts instead of being between the surfaces as in the Curtiss machines. These ailerons are operated by the usual shoulder control.

Instead of using sockets as formerly, aluminum castings are now employed for connections. The surfaces are of Irish linen with a special preparation which is put on after the surfaces are in place. The cloth is stretched as tight as a drum head and has a breaking strain of 71 lbs. per square inch. The front control is a little smaller than that employed in the former machine (of which full drawings were published in AERONAUTICS.). Also, there is a flap attached to the rear of the back horizontal surface which works in conjunction with the elevator through crossed wires. The whole rear horizontal tail can be quickly shifted to various angles of incidence, merely by loosening a metal clamp around the short vertical posts at the extreme end of the outriggers and reclamping at the desired place on the post.

Baldwin Flights at St. Louis.

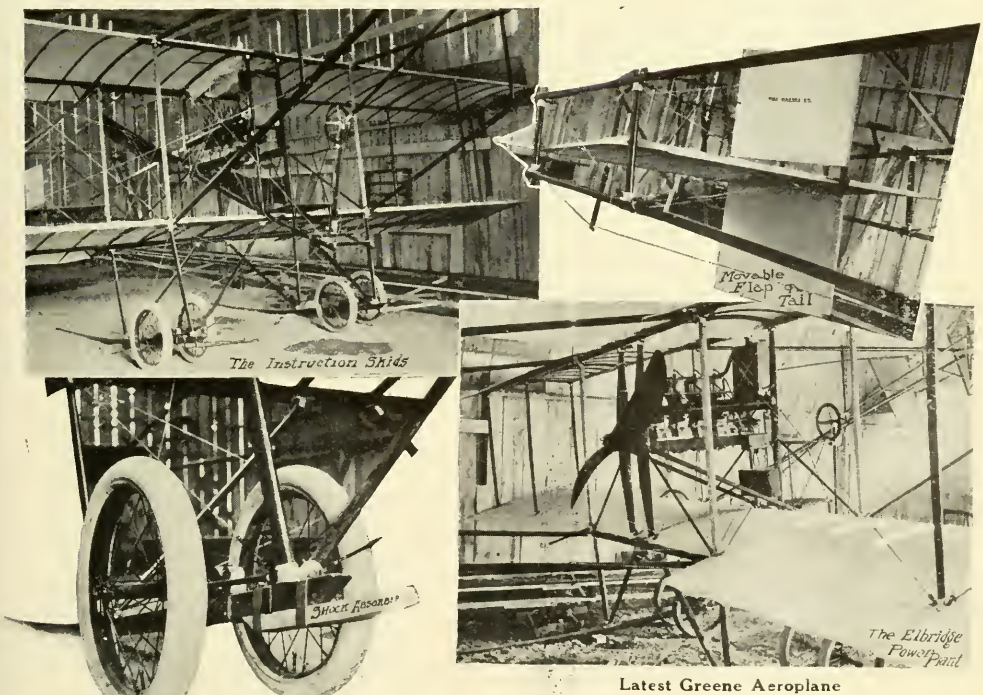
St. Louis, Mo.—Capt. T. S. Baldwin made some fine flights along the river front on September 10-12. These flights were his first real ones at an exhibition and no one can kick at the "young man" now. In one of these, taking 10 minutes, when he crossed over three and flew under two bridges while in the air. Including the time he was on the ground between the flights, it was thirty-six minutes from the time he started until he landed on the aviation ground again.

Hill, Beachey has assembled the Gill machine bought by T. W. Benoist, of the Aeronautic Supply Company, and made first trials.

Selfridge Monument Erected.

A monument to Lieut. Thos. E. Selfridge has been completed, and was erected over the grave by E. A. Selfridge, father of Lieut. Selfridge. There will be no unveiling ceremonies or dedication of the monument. It has been a tribute of the family throughout, and will not be attended by any public recognition. The inscription on the tablet is as follows:

FIRST LIEUTENANT
THOMAS E. SELFRIDGE,
1ST REG'T. FIELD ARTILLERY,
U. S. A.
KILLED IN THE SERVICE
OF THE UNITED STATES
IN AN AERODROME
ACCIDENT
SEPTEMBER 17th, 1908.
AGED 26.



Latest Greene Aeroplane

AT THE MINEOLA AVIATION GROUNDS

Review of the Month's Flying.

The past month at Mineola has not seen quite so much flying as heretofore since Harmon's flight across the Long Island Sound, as the machine was damaged on that occasion and later was shipped to Boston. Capt. Baldwin has been away and H. S. Harkness with his Antoinette has been doing nothing more than running over the grass, getting used to the grounds and machine, after being out of the game for some months. Joe Seymour has been flying constantly right along.

Tod ("Slim") Shriver has brought out a new machine of a general Curtiss type, in which the ailerons are outside of the main cell and attached to the rear supports. Equipped with a Kirkham six-cylinder engine, he has been making some good short flights. The machine was constructed by Mr. Shriver for Howard Dietz.

The second week in September, P. Brauner & Co. brought out one of their stock machines of a general Curtiss type, 30 x 4½ ft., fitted with a British-American 26-h. p. stock automobile engine driving a Brauner 6 ft. diameter 4½ ft. pitch propeller, giving at 900 revolutions 185 lbs. thrust. Some short flights have been made in it by D. Masson, who was mechanic for Paulhan when he came to America. The front elevator is a single surface. Equipment includes the El Arco radiator, Bosch magneto and Palmer tires.

Frank Van Anden has another biplane ready for trial, fitted with a Cameron air-cooled automobile engine with auxiliary exhausts. It would be of interest to know how this cools and to see with what success flights are made, as the engine is rated at but 24 h. p. The running gear is similar to Capt. Baldwin's, with the front wheel off the ground. Pennsylvania 20-in. wheels and 4-in. tires are used. The motor has a Splitdorf magneto and Breeze carburetor, as generally supplied with Cameron engines.

Dr. H. W. Walden is building a shed of his own and is progressing with the remodeling of his wrecked monoplane. The new one will have Pennsylvania 4-in. tires and the holes in the ground won't be so effective.

An innovation in cooling systems is employed by George Russell and J. J. Frisbie. Two small El Arco radiators are used, placed one on either side of the operator, where they get all the air there is coming. These work very satisfactorily this way, and the head resistance does not seem to have been any objection.

G. E. DeLong, designer of the Elbridge engine, has started a training school, using a Shneider-built Curtiss-type aeroplane, which he purchased some time ago. E. F. Gaskell, 2308 Seventh avenue, New York, and F. E. de Murias, Babylon, L. I., are the first pupils. Wisely enough, the school does not undertake to pay the damages sustained in trials.

W. L. Fairchild is out mornings and evenings practicing with his big monoplane, fitted with an Emerson six-cylinder engine, about which he is enthusiastic. It drives by a chain two propellers.

The George Russell machine has had its power plant changed over from a Curtiss to a four-cylinder Elbridge. The first part of September he gave exhibitions on Staten Island. One of the most successful experiences he had was a collision with a cow. So far as we are able to ascertain, this is the first time that an aerial milking has been attempted.

Sam Barton, of 238 Dumont avenue, Brooklyn, is putting together in the Aeronautical Society's sheds a small biplane with a two-cylinder Elbridge engine. This more or less resembles a Curtiss machine. The elevator and the horizontal tail will work in conjunction. The machine is only partially assembled thus far. Hartford tires are being used on specially built home-made wheels.

Miss E. L. Todd has a Rinek eight-cylinder engine.

Nicholas Rippenbein is completing the assembling of a light Farman type machine which was bought from Fred Shneider. The ailerons in this machine are between the surfaces, and instead of being hinged at the struts and moved up and down, are mounted on a shaft running fore and aft between the main surfaces. At the end of the shaft is a grooved pulley over which crossed wires run.

Harry Chandler, of the Auto & Aeronautic Supply Co., and Glenn Ethridge, both of Westbury, L. I., are building a biplane of radical construction as regards sockets, engine beds, controls and angle. This is now ready for trial. The equipment includes an Elbridge four-cylinder engine, A-Z radiator and tank, and Hartford tires.

Philip W. Wilcox, of the Columbia University Aero Club, has had bad luck. His first trial some two months ago, resulted in smashing the running gear on the ground. Charles K. Hamilton flew it next time and broke up the landing arrangement again. After it was all fixed up anew, stronger, and with big 4-in. Pennsylvania tires, Wilcox attempted flight himself and succeeded at the first jump, with all the power of the Rinek eight-cylinder engine behind him. For some little time flights were made before the machine was reduced to a wreck. He is now going at it again and will build two machines. With a Rinek propeller, 7½-ft. diameter by 4-ft. pitch, the engine gave over 350 lbs. thrust standing.

The Garden City Co., which erected a fence and grandstand around the grounds and now charge admission whenever there is a sufficient crowd of sightseers, has established a system by which the aviators receive a certain portion of the profits, proportioned according to the extent of the flights made by each.

The erection of the fence, the independent attitude assumed by the Company and the alleged nonfulfillment of promises made by it has resulted in considerable friction. The Aeronautical Society has given the Aero Club of America an opportunity to join in a protest and issued a statement of which the following is a part:

August 22d, 1910.

The Garden City Company,
60 Wall Street, New York City, N. Y.

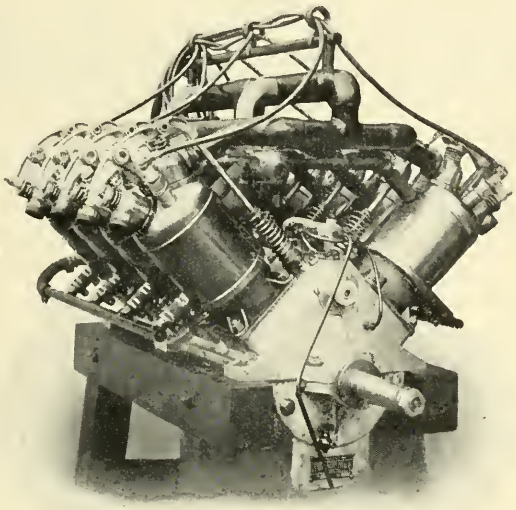
Gentlemen:—When you recently (without our consent) erected a high fence around the property which you leased to this society at Mineola and constructed a grandstand and ticket office, you argued it advantageous to us and promised to account for all funds and see that conditions were improved generally. You now refuse to account for what you have collected and spent and are continuing to force the public to pay money to you to witness the flights of members of this and other clubs on your property. You are also collecting money for other privileges, such as stands, sign spaces, etc., and the public are led to believe that we are the interested parties, although we never have been and do not wish to be interested in the receipts of your enterprise.

We object to this method of exploiting our members. Had you turned these matters over to a joint committee representing all interests, the members and their friends would not be repeatedly interfered with by the representatives of your real estate, and everyone legitimately interested in aeronautics would have been better satisfied.

In view of the foregoing we are obliged to notify you that if conditions are not improved we shall be obliged to restrain you from further interference with our rights on the property.

The Aeronautical Society.

At Garden City, L.I.



IT WAS WITH A

RINEK

50 H. P., 8 Cylinder Engine

THAT

PHILIP W. WILCOX

President Aero Club, Columbia University

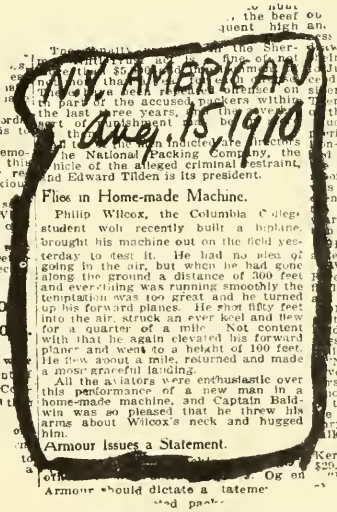
On Sunday, Aug. 14, 1910

FLEW On first attempt, making a complete circuit of the Aviation Field, at an average height of from 75 to 100 feet. The aeroplane was of the Farman type, and the speed estimated was about 40 miles per hour. Mr. Wilcox has since been making almost daily flights, duplicating the above.

RINEK: Engines have within the past month or so come rapidly to the fore, and are to-day admitted by experts as second to none for aviation.

Successful Aviators Know Their Value

Any doubt you may have as to the *Superior Qualities* of the *Rinek Engines* must be dispelled after consideration of the fact that they are amongst the very few which have been found *"All There,"* under the severest flying conditions :: :: :: :: :: ::



N.Y. AMERICAN Aug. 15 1910

Flies in Home-made Machine.

Philip Wilcox, the Columbia College student who recently built a biplane, brought his machine out on the field yesterday to test it. He had no idea of going in the air, but when he had gone along the ground a distance of 300 feet and everything was running smoothly the temptation was too great and he turned up his forward planes. He shot fifty feet into the air, struck an even keel and flew for a quarter of a mile. Not content with that he again elevated his forward planes and went to a height of 100 feet. He flew about a mile, returned and made a most graceful landing.

All the aviators were enthusiastic over this performance of a new man in a home-made machine, and Captain Baldwin was so pleased that he threw his arms about Wilcox's neck and hugged him.

Armour Issues a Statement.

Armour should dictate a

TYPE B-8, 60 H. P., weight, 275 lbs. complete
TYPE B-4, 30 H. P., weight, 130 lbs. complete

Phenomenal Efficiency **PROPELLERS** Finest Material and Workmanship

THE RINEK AERO MANUFACTURING CO.

EASTON, PENNA.

AERONAUTIC MOTORS

MESSRS. LANDAU, MOULTON and HOWE beg to announce that they have succeeded the engineering firm of Landau & Golden, and have established engineering offices at 1777 Broadway, New York, for the designing, building and testing of aeronautical motors.

They have a large force of experienced designers whose services are at the disposal of those desiring to develop their own ideas, and have facilities for conducting such work in strict privacy.

They also make investigations of new devices and manufacturing projects, and act as consulting engineers.

In addition to the above they specialize in the calculation of stresses in structures, and conduct tests on the strength of materials.

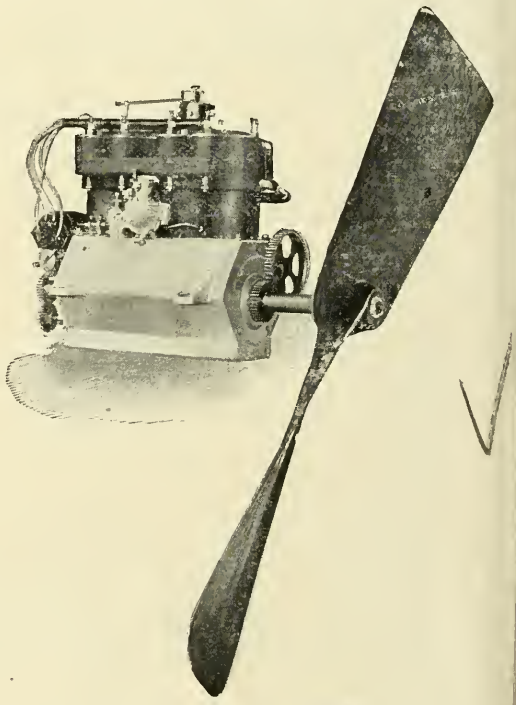
Landau, Moulton & Howe, Engineers

Detroit Aeronautic Construction Co.

BUILDERS OF

Complete Light-Weight Aeronautic Power Plants

4 cyl. 30 to 40 H. P. $4\frac{1}{2}$" x $4\frac{1}{2}$"
4 cyl. 40 to 50 H. P. 5" x 5"
6 cyl. 50 to 60 H. P. 5" x 5"



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Detroit Aeronautic Construction Co. 306 HOLCOMB AVENUE DETROIT, MICH., U. S. A.

Price $400 110 lbs. Weight

Ready to Run, including Magneto and Carburetor

Detroit Rotaero

Two Cycle Rotary
Five by Five

Michigan Airship Co.

Manufacturers
Detroit, Mich.

Home of Gasoline Engine Industry

Brake H.P. 30
Minimum
At 1200 R. P. M.

Guarantee
Weight, Quality
Horse Power

EDWIN HOPKINS PAUL DE KILDUCHEVSKY

THE

H.-DeK. MOTOR

60-80 Horsepower - $1200
Weight 160 lbs.

30-40 Horsepower - $1000
Weight 110 lbs.

¶ The Ideal Motor for Aviation. Reliable, Perfectly Designed and Balanced. Durable, Powerful and Unequalled in Construction and Finish.

ABSOLUTE GUARANTEE
And any test you want under any conditions

YOUR MONEY BACK
If you are not thoroughly satisfied with the motor in every respect

DELIVERY IN FROM 3 TO 5 WEEKS

¶ **Special Offer:** Ask for our special offer. It enables aviators to get the motor question settled right, with greatly reduced initial outlay.

HOPKINS & DE KILDUCHEVSKY
1535 Broadway, Cor. 45th St.
Tel. 3791 Bryant New York, N.Y.

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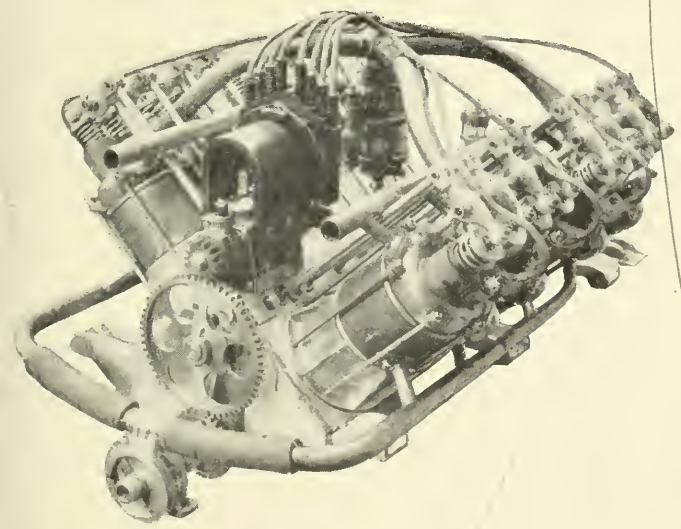
Simplicity—Lightness Strength—Constant Power



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¶ Four Cylinders, 30 Horsepower, weight complete with carburetor, magneto and water pump, 130 pounds.

TYPE A-2

¶ Eight Cylinders, 60 Horsepower, weight complete with carburetor, magneto and water pump, 235 pounds.

¶ Light weight efficient radiators and laminated elm and mahogany propellers of original design and maximum efficiency.

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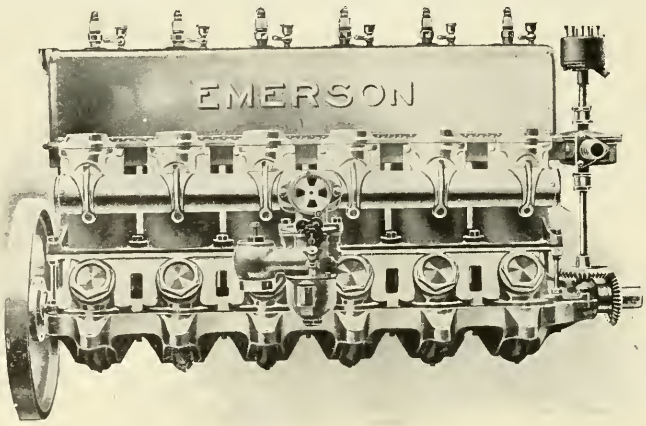

60 to 120 H. P. type Adopted by the largest aeroplane makers and acknowledged to be superior in workmanship, finish and reliability.

Compare them for power and weight. 456 pound thrust with eight foot propeller, five foot pitch, at 1000 R. P. M. Get our catalogue and reference sheet.

THE EMERSON ENGINE CO. Inc. Alexandria, Va., U. S. A.

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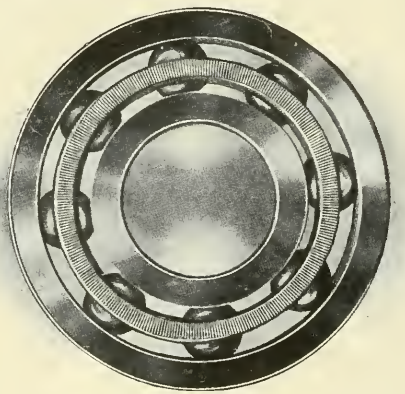

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Absolutely Guaranteed.

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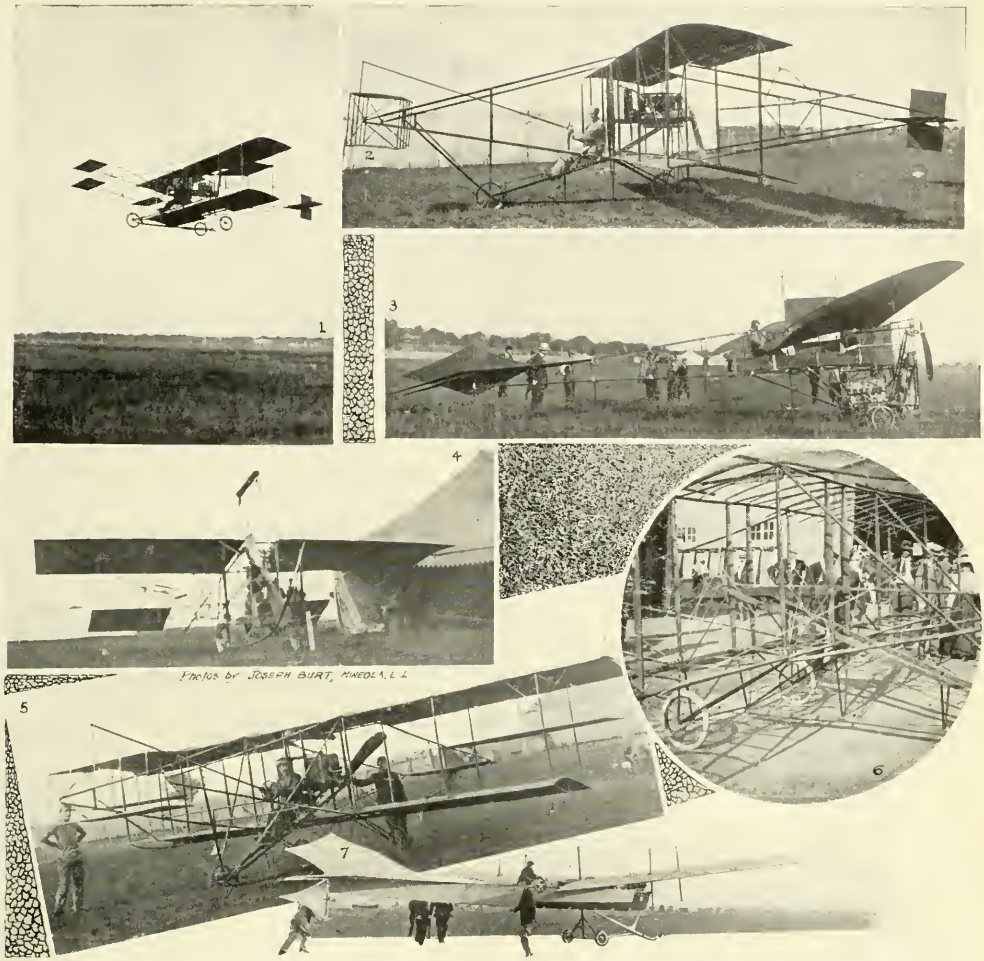


1.—J. J. Frisbie, Flying. 2.—Shriver-Dietz Machine. 3.—W. L. Fairchild's Monoplane. 4.—E. E. Burlingame. 5-6. Frisbie Machine. 7.—Harkness' Antoinette.

C. S. Peets and D. C. Teetor, of the Hudson-Fulton Automobile Co., at 247 West 47th street, New York, will shortly begin trials at Mineola with a biplane, principally on the lines of a Curtiss, with Farman type running gears. Messrs. Peets and Teetor were members of the West Side Y. M. C. A., aero class of 1909, with Wilbur R. Kimball as instructor.

Wilbur R. Kimball is about to begin the construction of an entirely new type of machine, after a year of laboratory work and experimenting with the object of combining lifting power and the propelling force of propellers in connection with planes. A model has been constructed and successfully flown that shows remarkable properties of equilibrium and ease of control, and an increase in the thrust obtained from propellers.

Frisbie New Mineola Star.

J. J. Frisbie has been the sensation of the Mineola field. He did not spend any time running around the ground, but attempted flight the first crack out of the box, and has been flying regularly every day, with the exception of the first half of September, when he arrived at Rochester. He has proven to be one of the most apt students of flight that has been seen at Mineola.

TRIALS AND TRIBULATIONS.

Frisbie first appeared in the aviation camp at Mineola early in the spring. He had a few hundred dollars and the determination to become an aviator. Someone offered to sell Frisbie an aeroplane, all right from the ground, splendid motor, etc. And Frisbie spent weeks that ran into months waiting for the demonstrating flight,—which never came. After a long time a machine was alleged to be assembled and a thing called an aeronautic motor was installed. The outfit collapsed after a run estimated at eighteen seconds. Frisbie had spent thirteen weeks and all his money waiting for it.

He returned to Rochester with five cents in his pocket, a number of obligations, among them the support of a family. About the only thing he had left was determination to win out, and a lot of friends.

After further weeks of trial he secured enough backing to insure the building of his own 'plane, and he ordered an Elbridge engine. In less than a month he was ready for the air, and twenty-four hours later he had made five short flights.

If the affair had been less serious, Frisbie's first flights would have been humorous. Advised not to leave the ground for at least a week, Frisbie started virtuously to run across the field to learn the use of the different controls, but he reckoned without the thrust of the 40-h. p. two-cycle engine. It never occured to him to throttle down, so in a few seconds he was bounding across the field at a terrific rate of speed: a piece of rough ground jarred his arms enough to affect the front control,

and less than half a minute from the time of all his good resolutions he was in the air, 20 or 30 feet above the ground. He wavered, he wobbled, the machine slanted from the torque of the propeller; Frisbie had presence of mind to straighten up and to try to get nearer the ground. No difficulty about that; he pushed the control forward half an inch and the machine dove for the ground like a falling skyrocket. Frisbie yanked back on the control to avoid the ground, and started up on an angle that suggested an attempt to loop the loop.

He landed unharmed, however, and started out again. Day after day he kept at it, practicing whenever the breezes dropped below 10 miles an hour. In two weeks he had successfully accomplished a 10-mile cross country flight, flying two or three times around the field as a preliminary, and then, without descending, starting out across country and flying over the polo field at the Meadow Brook Club, circled over the Motor Parkway, passed over Westbury, and returned to the field in 14 minutes from the time he started.

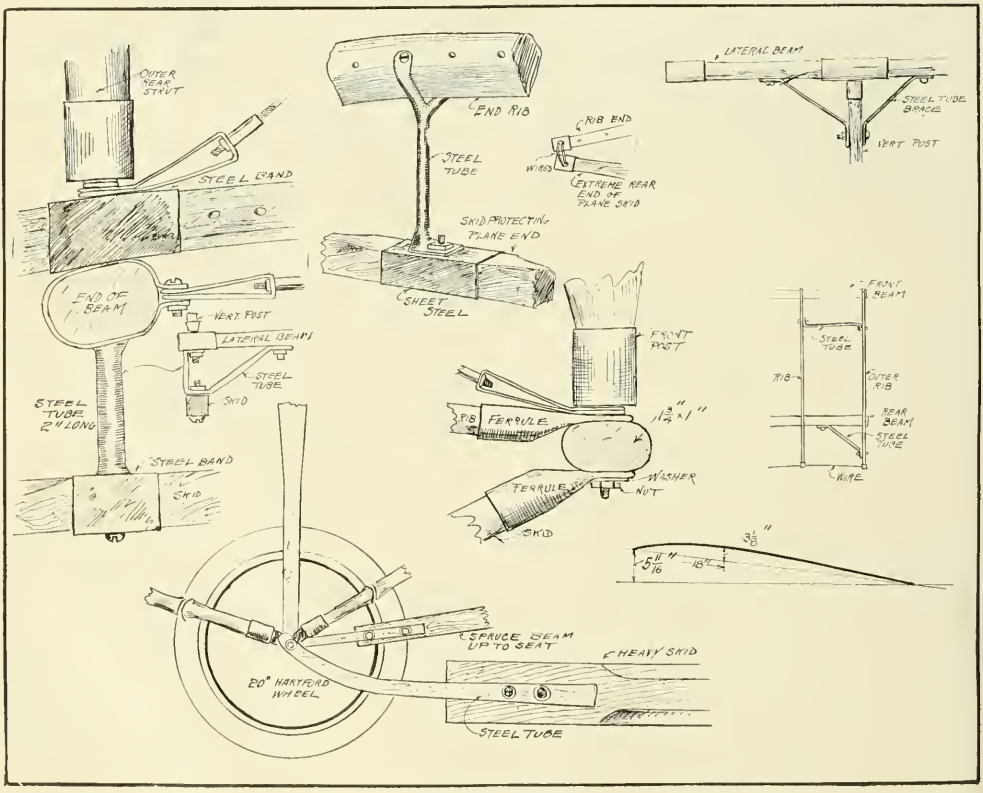
On another occasion, when Acting Mayor Mitchell of New York visited the field, Frisbie made several flights in the rain. He also has made a flight of some miles after dark, and safely carried his son as a passenger on one of his early trips.

At Ontario Beach Park, near Rochester, N. Y., on Labor Day, J. J. Frisbie made his first appearance as a professional aviator, just about three weeks since he made his first tentative flight at Mineola. There Mr. Frisbie, anxious to make good before his backers and fellow-townsmen, tried one of the most difficult things so far attempted by any aviator. The only place from which he could get any start was a bit of lawn about 200 feet wide, bounded by poles, a hotel, a merry-go-round, and sideshows; in front steep rollers piled themselves on the beach, driven by a high wind. Not counting the people who crowded around the machine, the actual space between material obstructions through which Frisbie had to guide his 'plane was exactly 40 feet. Minor embarrassments were two asphalt sidewalks he had to cross, each high enough above the level to smash the wheels on his first attempt to rise. Four times he started, and four times dropped into the lake, but the fifth time his nerve and perseverance triumphed and he rose safely to a height of 50 feet and sailed around the park, only to be again obliged to land in the surf because the dense crowd left not a foot of space on the shore.

After being fished out of the water the first time, the gasolene valve was found to be closed. The gasolene was turned on, and off the motor started. The Atwater-Kent coil was changed the next day for a magneto. One trial resulted in a smash on the sand, and he had to fly the next time with a split propeller patched up with tin on one blade. Another time the motor short-circuited itself just as he was out over the lake. The next time the propeller was smashed when it struck the water. To prove that he can fly, Frisbie decided to stay in Rochester until he could either fly across the city or cross Lake Ontario.

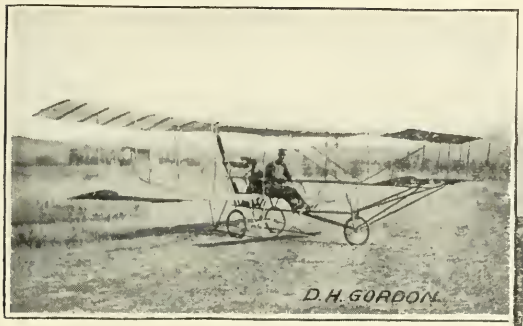
The Frisbie Machine.

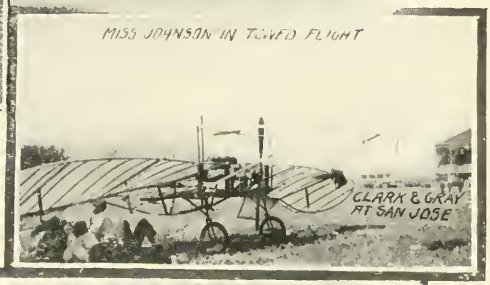
The machine of J. J. Frisbie is a close copy of the Curtiss. The lower plane has 26¼ ft. spread by 4½ ft. fore and aft. The top plane overhangs on each side 32 in. They are spaced 4½ ft. apart. The bamboo outriggers front and rear extend 12¼ ft. The double surface front control measures 6 ft. by 28 in., surfaces 2 ft. apart. The horizontal tail is 6 ft. by 28 in. The vertical rudder is 34 in. high by 28 in. the other way. The ailerons are 92 in. spread by 30 in. fore and aft, extend 8 in. in front of the struts, and are pivoted on the outer front strut. The engine is an Elbridge 4-cylinder, 40 h. p. Two El Arco radiators are used, situated one on either side of the operator.



Some Frisbie Details.

FLYING OUT ON THE PACIFIC COAST





By Cleve T. Shaffer

Flies With 5 H. P.

DONALD H. GORDON, of Bostonia, Cal., has a biplane with which he has been doing some remarkable work. The machine has a 5 h. p. cyl. motorcycle engine, and with this motor and a geared down propeller of his own manufacture, he claims to have made flights of up to 500 ft. in length. As the weight of the machine complete with operator is 380 pounds this would give a load carried per h. p. of 76 pounds, which is remarkable. The machine in general construction and detail reminds one of the Roe triplane, inasmuch as the same low h. p. is used, and it has the same inverted triangular fusilage and general appearance. Following is a description: Top plane 26 ft., lower 24 ft., chord 4 ft. Distance between planes 4 ft. 4 ins. Angle of incident same on ground as in flight, about 7°. Planes are constructed with a view to automatic balance, and so far Mr. Gordon has never had an occasion to use the lateral stability device which he has also placed on the machine, even when flying across a 15-mile wind. He claims the machine would tilt to 30° angle when struck by gust, but would right itself automatically. Camber of chord, 2¾ ins. in 48 ins. Planes in three block sections, semi-circular rudder operated by foot lever, double front elevator, 32 sq. ft. area. Power plant, 2 cyl. Curtiss motor-cycle engine, cyls. 3½x3½, weight 78 pounds with batteries and coils. Propeller, 6 ft. diameter, 5 ft. 8 ins. pitch, cedar and spruce of Mr. Gordon's own manufacture. The motor is speeded to 2,100 revolutions and drives a geared down propeller at a little over seven hundred. Weight of machine complete 240 pounds. Mr. Gordon's weight is 140 pounds. A three-wheeled chassis is used with a novel type of suspension of the two rear wheels. The two-leaf spruce strips with axle attached in center are pivoted at the front and are attached to skid at the rear by springs. Mr. Gordon's longest flights have so far been from 450 to 500 ft., which is the longest distance engine will run at full speed without overheating, which of course causes it to slow down. He is now putting in a cooling fan and exhaust ports to keep the motor cool for longer flights. He is also installing a 7 ft. propeller to run at a slower speed than the present one. The fields are so rough around his vicinity that he claims that it is very hard to build a machine capable of standing the racking. He has had very little trouble, however, beyond breaking a wheel or two. Mr. Gordon has also had considerable experience with gliders, having made in the neighborhood of 50 flights of about 150 yards in length. In all of these, he says, he never had the suggestion of an accident and hardly broke a stick, reached heights of 20 ft. and flew in winds about 15 miles per hour. He uses an inclined rail with his glider.

J. E. Clark, of San Francisco, has a biplane of the new Farman type near San Jose, Cal., in which he is said to have made some very good flights, the longest of about a mile. The machine is 33 ft. spread on the top plane and 21 ft. on the bottom, by 6 ft. 3 in. chord, 36 ft. fore and aft, single laminated ribs. A Sommer type chassis is now used but will be changed to the four wheel Farman type. An Elbridge 40-60 h. p. engine drives direct an 8 ft. diameter propeller, 4 ft. pitch, thrust has not been measured. Bosch magneto is installed. Lateral control is by shoulder brace connected with semi-circular ailerons between the ends at rear of planes, and the rest of the control is similar to the Curtiss with the usual wheel. Curvature of ribs 1 in 14. Angle of incident on the ground about 6 or 7 deg.; 5 deg. approximate

flying angle. Planes are covered with Naiad No. 6 laced on in panels. Weight of machine complete 530 pounds.

Charles Bradley, of the Pacific Aero Club, an account of whose large, high pitch, propellor test was in the September issue of AERONAUTICS, got off the ground, for a short jump, with his biplane on September 5 in the presence of your representative. The clutch would not hold, however, machine came down and ran into a ditch, the axle bent in a semi-circle but the "Camsc" wheels did not "dish."

Mr. Bradley said that all he wanted to know was if he could get off the ground with his large propeller and small horsepower, and as he was successful in this, and the machine was of rather crude construction he demolished it and will now begin work on a new one.

By Prof. H. La V. Twining

In January, 1910, after the Los Angeles midwinter meet, Chas. K. Hamilton went to San Diego, Cal., and spent three days flying on Coronado Island. On this occasion he flew across the bay and down the beach into Mexico and return. At this time Chas. F. Walsh, of San Diego, had a monoplane which he attempted to fly. Instead of flying, the machine ran into a fence and became a total wreck. By May 2, 1910, Mr. Walsh had constructed a biplane of the Curtiss type with which he is flying. Since that time he has made some 200 flights of 500 feet to 1¼ miles in length, reaching an altitude of from 10 to 80 feet. Mr. Walsh has modified the Curtiss method of control, using a design of his own devising. The machine is equipped with a 40 h. p. Elbridge engine. The aeroplane weighs 380 pounds and has 400 sq. ft. of surface. It spreads 40 feet from tip to tip.

Mr. George Duessler has been making short flights in his biplane at the Los Angeles aerodrome where the Aero Club of California has its headquarters. The flights average some 300 feet. On one occasion he covered 495 feet, just missing the winning of the Knabenshue cup.

The winner of the cup must fly 500 feet under power in a machine of his own construction. He must also be a member of the Aero Club of California. The last of August Mr. Duessler blew out a cylinder head and is now repairing his engine. J. J. Slavin is also having trouble, but will soon be in shape to again try for the Knabenshue cup, after his accident of a few weeks ago. On this occasion he rose from the ground at too sharp an angle, to an altitude of 25 ft., where the machine lost headway, resulting in a crash to the ground. Several members were broken and the running gear was smashed. Mr. Slavin escaped unhurt. Slavin has a 3 cyl. 30 h. p. Elbridge engine.

On August 28 the Cannon brothers towed their Curtiss biplane behind an automobile. The machine rose some 10 ft. above the ground where it was maintained by use of its controls. This furnishes excellent practice, and as soon as they get their engine installed we can expect some flying. On several of their towed flights they carried a passenger.

The Twining ornithopter, number 3, was given a trial last week. This model weighs 115 pounds and the operator 150 pounds, making a total weight of 265 pounds. The wings are 12 ft. long by 4 ft. wide, giving about 100 sq. ft. of surface. More powerful leverages were used in this model and a good up stroke of the wing developed.

The experiment developed a slight drive along the ground, and on one occasion it rose bodily from the ground to the height of one inch, upon the down stroke of the wings. Early in the trial one wing was broken so that it became flexible around its front edge. In this condition the wing drove the machine forward but lost in lift.

This model is a great improvement over model No. 2, a lift of 265 pounds being obtained as against 120 pounds in the other one. Larger and stronger wings will be constructed and another trial be made this fall.

Hamilton Injured.

Chas. K. Hamilton, flying for his own account a brand new machine on the style of a Curtiss, but fitted with a 100 h. p. engine built to order by Walter Christie, met with an accident while flying at Sacramento, Cal., on September 9. In a previous flight the machine was damaged, but the aviator unhurt. He was burned by the water from the radiator and severely cut and bruised. It is believed there will be no serious results.

INCORPORATIONS

Fisher Aero Craft Construction Co., of New York, New York; manufacture, deal in and lease air crafts of all kinds; capital $100,000. Incorporators, P. J. Fisher, Encoland S. Bates, Hieronimus A. Harold, all of No. 135 William St., New York City.

The Standard Airship Co., Cleveland, T. P. Howell and others; $5,000.

Frankford, Ind., July 15.—The La Marr Aero Co., of Frankfort, Ind., organized to manufacture aeroplanes, $50,000. Officers are W. B. Adams, president; Perry Gable, secretary, and Fay Cress, treasurer.

The Standard Airship Co., of Columbus, O., $5,000, for the purpose of building airships. The company will build and sell aeroplanes constructed under patents held by H. J. Sharp. Incorporators of the company are T. P. Horrell, C. A. Ricks, A. Y. Gowen, W. C. Saeger and G. B. Collins.

Illinois Aviation Co., Chicago; manufacturing amusement devices; capital, $1,400. Incorporators, Leon S. Alschuler, Gabriel J. Norden; Chas. W. Steefel.

MacLeod Multiplane Co., Borough of Richmond, N. Y.; manufacture and sell aerial machines; capital, $10,000. Incorporators, Malcolm MacLeod, 268 Columbus Ave., New York City.; John T. Oates, 703 Bay St., Stapleton, N. Y.; James E. Forrest, 276 56th St., Brooklyn.

The Aerovehicle Co., of Atlantic City, N. J., to manufacture and sell all kinds of vehicles for aerial transportation; $125,000. Incorporators, James R. Greig and Samuel C. Fenner of Philadelphia and Eli H. Chandler of Atlantic City.

Aerocraft Co., Chicago, Ill., $10,000; general manufacturing, commercial, exhibition and transportation business; Benjamin I. Gates, H. H. Abernathy, J. J. Zinn.

American Aeroplane Manufacturing Co.; New York; manufacture and deal in aeroplanes, gilders, motors, etc.; capital, $100,000. Incorporators, Benj. E. Freed, 506 E. 188th St., New York City; Peter J. Minck, 55 Beaver St., Brooklyn; Stuart J. Lebach, 50 Morningside Ave., New York City.

Atlantic City Riviera Parkway Ocean Pier Co., Atlantic City, N. J.; to acquire premises to construct and operate aeroplanes, aerial transportation systems, airships, etc. Samuel J. Clark, Raymond B. Thompson and Graham Shaw incorporators. Capital stock $100,000.

Aerial Manufacturing & Supplies Co., New York; manufacture aeroplanes, gliders, automobiles, hydroplanes, etc.; capital, $50,000. Incorporators, Samuel Shethar, Great Neck, Nass. Co., N. Y.; John Loughran, 155 2d Ave., Long Island City; Chas. H. Stoll, 55 Liberty St., New York City.

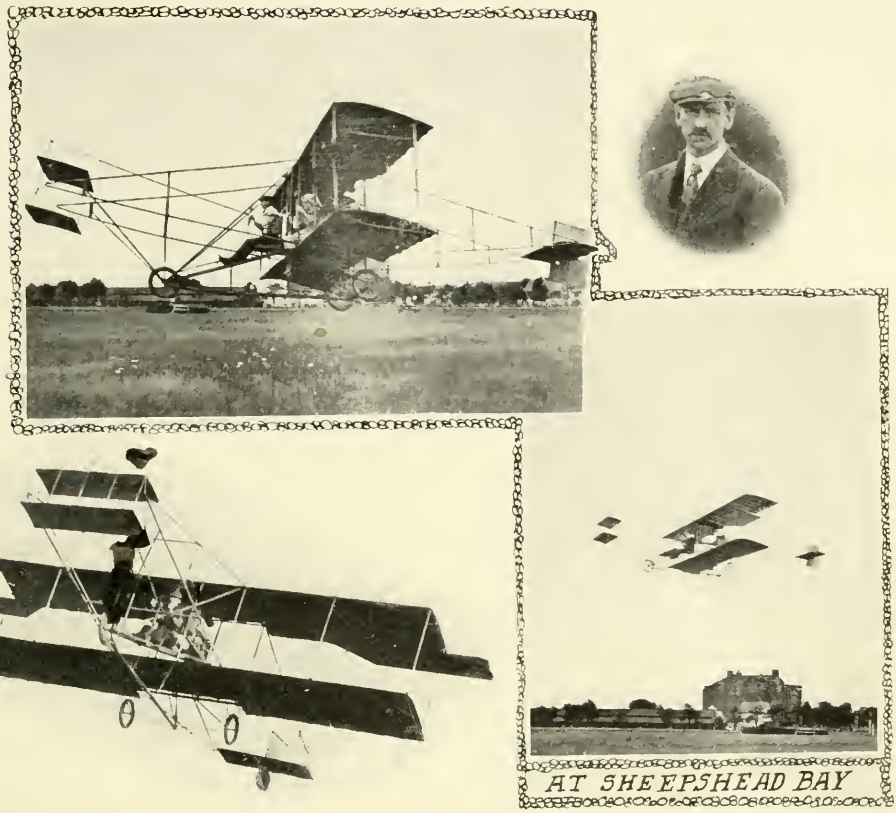
The Curtiss Exhibition Co., $20,000, Hammondsport, N. Y.; promoting exhibition flights with aeroplanes and the selling of aeroplanes for exhibition purposes. Directors, Glenn H. Curtiss, Jerome S. Fanciulli and Monroe Wheeler.

Bath Motor Mfg. Co., Bath, N. Y., $300,000, taking over Kirkham Motor Co.

Charliss-Wendling Automatic Aeroplane Co., of Houston, Tex., is being organized by C. F. J. Charliss and A. Wendling to manufacture aeroplanes.

The Zodiac Sky Advertising Co., Narragansett Pier, R. I. E. Stuart Davis is president and Sydney S. Breeze of New York is vice-president and general manager. The directors of the company are Edward S. Beade, James M. Satterfield and Benjamin Burgess Moore.

MEETINGS COMING, GOING AND GONE



Asbury Park Meet Concluded.

The flying by Brookins, Hoxie, Coffyn and Johnstone proved so satisfactory to the Asbury Park committee that the series of flights were continued up to and including August 27th. The meet began on August 10th.

To cover fully the various stunts performed by the Wright machines under the guidance of such skillful aviators would take a number of pages of the magazine. From 3 o'clock in the afternoon till almost dark there was something doing every day. Flights were made out to the ocean and back, to various nearby resorts; on one occasion a landing being made on the Deal Beach Golf Links, the machine was started again and the return made. This flight was by Brookins and Coffyn, a passenger flight.

NEW WORLD'S RECORD.

Walter Brookins, whose nose was seriously damaged when his machine was wrecked against the grandstand on the opening day, was not out of commission long. On August 23d he shattered his former record for a complete circle by making one in 5¼ seconds. Johnstone made numerous high flights, going up to 3,000 feet; and many of the flights lasted 30 to 45 minutes.

4,000 FEET HIGH.

On the 19th Hoxie and Johnstone each made moonlight flights with none for spectators save the birds, and they were asleep. In the afternoon of the same day Hoxie was up for 52 minutes, reaching an altitude of 4,000 feet.

AERONAUTICS' EDITOR RIDES.

On two occasions novices were taken up for rides, only "joy rides," as the aviators call flights of ten minutes or so. The publisher of AERONAUTICS, E. L. Jones, was one of these two lucky individuals, and the star reporter on the New York *Sun* the other. Brookins took the former on the latest machine, minus the front control and mounted on wheels, up to 500 feet, sailed around the field a number of times, made two of those short circles for which Brookins is so famous, then shut the motor off and slid rapidly to the ground.

It actually makes one's heart almost stop beating to see Brookins start his aeroplane downwards, tilt up on one corner and then make a hole in the air like a cork-screw in a cork; but to be a passenger on one of these whirls, find yourself slipping sideways off the seat, with the green grass showing in a nice little square patch down below through the end of the plane, is *some* experience. The passenger is likely to wonder if it is not possible that on this one occasion a puff of wind may carry the machine just a degree or two beyond 90, with a finale in Davy Jones' locker.

This is real flying and a passenger's sensation in a flight like this varies considerably from those in a straight-away a few feet off the ground. After such an experience the passenger is likely to have considerably more respect for the capabilities of the expert bird-men. Yet one must consider that this was but a commonplace "joy ride," for the intrepid Brookins is doing these stunts day after day, in his efforts to "demonstrate," as he says, "the practicability and safety of the Wright aeroplane."

Sheepshead Bay Meet.

BY FRANK S. TILLMAN.

New Yorkers were given their first real aviation meet the last two weeks in August, at the old Sheepshead Bay race track by Glenn H. Curtiss, and his flock of birdmen, composed of J. C. ("Bud") Mars, Chas. F. Willard, Eugene B. Ely, J. A. D. McCurdy and Augustus Post.

Several experiments that proved the aeroplane's value in a new sphere were successfully accomplished during the six days the birdmen were flying at the field.

The greatest of these was the wireless telegraph message sent from an aeroplane in flight by J. A. D. McCurdy to H. M. Horton, the designer and operator of a practical wireless outfit especially adapted for sending messages from an aeroplane in flight to a ground station.

Next in importance, from a scientific standpoint, was the test for marksmanship with a regulation U. S. Army Springfield rifle, by Lieut Jacob Earl Fickle, 29th Infantry, who fired and hit a target placed on the ground while aloft a hundred feet with Glenn H. Curtiss.

The meet opened on Friday, August 19, and was originally intended to last but Saturday, August 20, and Sunday, August 21. Due to the success of the first three days the meet was extended and lasted three additional days of Friday, August 26th and 27th, closing on Sunday, August 28th.

The opening day was featured by the number of passengers carried by Curtiss and Mars. A representative of every New York daily newspaper was given a ride either by Curtiss in his Hudson Flyer or by Mars.

It was on one of three trips when he had Frank D. Caruthers, a well-known New York newspaper man, as passenger, that aviator and passenger all but came to a disastrous finish. Mr. Caruthers has the distinction of being the heaviest man ever carried as a passenger in a Curtiss aeroplane, his weight being over 195 pounds. It was this fact, however, that nearly resulted in an accident.

As in all his passenger flights Mars started at the upper end of the field and after a short run flew gracefully to the lower end. Instead of stopping there with Mr. Caruthers, Mars determined to make a turn and land his passenger at the starting point.

Half way around an extra stiff puff of wind caught the heavily-weighted aeroplane and in an instant the machine was thrown almost on its side. For fully a minute there followed a pretty bit of air jo-keying. It required all of the skill of Mars to regain control of his pitching, tossing, tumbling machine. Experienced aviators on the ground held their breath at the sight and when Mars finally succeeded in weathering the storm and brought his machine safely to the ground he was greeted with a round of applause.

The flight, which was Mr. Caruthers' first trip in an aeroplane, had not impressed the passenger as it did Mars. Caruthers, when he finally climbed out of his seat to the ground, confessed that he had failed to realize the danger he was in while Mars was having his struggle in the air. The real danger to Mr. Caruthers appeared to be at the moment of landing when the aeroplane bounded over the ground.

In addition Mars took his wife, Mrs. Ely, wife of Aviator Ely; Joseph Pulitzer, Jr., of the New York *World*, and Capt. H. Kerrick of the U. S. Army, and others, for a short joy ride through space. Willard also took up passengers.

On Friday, the 19th, four machines were in the air over the same field, and all flying in the same direction.

On August 20, Lieut. Fickle, in service uniform with a full round of ball ammunition, first made a trial flight with Mr. Curtiss to determine if the vibration of the aeroplane would destroy his aim with a rifle. Finding that it would not, he placed a target in the center of the field of about three by five feet in size.

Then as a passenger with Mr. Curtiss he soared about 100 feet and fired downward while directly over his target and struck near the edge of the mark.

Notable was the sending of a wireless telegram by McCurdy on August 27th, from his aeroplane while high over Sheepshead Bay, to H. M. Horton on top of the grandstand at the track. The message was received by Horton on the top of the grandstand and handed to the group of newspaper reporters.

In order to develop the aeroplane wireless Mr. McCurdy and Mr. Horton since the meet have been

J. C. Mars and F. D. Caruthers

at the Curtiss factory, at Hammondsport, N. Y., where they have been making daily trials with the wireless apparatus, which has resulted in unusual results, messages having been sent as far as five miles to the stationary set from the aeroplane in flight.

When the final tests had been made and Mr. McCurdy was ready to make a flight and try out the instruments he was given what was destined to be the first wireless message ever sent from an aeroplane. It had been written by Mr. Caruthers at the request of Mr. Curtiss a week before. Mr. Caruthers has carefully preserved the original of the message which he prizes as one of his most valuable possessions.

The flights on August 26th were featured by the narrow escape and sensational flight made by Augustus Post, the amateur aviator, in a Curtiss biplane when he hurdled two fences and made two complete short circles at the end of the field when he avoided a fence after a beautiful flight across the race track.

Post had never been up very high before, nor had ever made a complete turn. He is the latest Curtiss pupil.

Eugene Ely, Mars and McCurdy broke honors even on Saturday, the 27th, Ely by flying the longest and the highest of any aviator during the entire meet and winning the trophy given by the Manhattan Beach Hotel for being the only aviator to fly over the bay to the hotel and alight on the beach, go in for his dinner and return to the field late in the evening.

Horton

Another chapter in aerial achievement is recorded in the sending of this wireless message from an aeroplane. in flight

J. A. D. McCurdy

Mars on this day hurdled all of the steeplechase hedges in succession in his aeroplane and also qualified for his aviator's license.

On the early morning of the 27th he dropped into the Lower New York bay from a height of 500 feet, in his eight-cylinder machine, and was rescued by the wrecker Hustler and taken into Seagate, L. I. The accident was due to a short circuit of the magnate, when the oil push rod came in contact with the cut-out.

Mars started from Sheepshead Park, flew out across the marshes towards Rockaway, then turned and flew over the ocean, passed in front of the Manhattan Beach Hotel, down past the lower end of Coney Island, at Sea Gate, then turned up the bay and dropped in the water between Swinburne Island and the Atlantic Yacht Club. The distance was about 8 or 9 miles.

The same afternoon at the Sheepshead Bay meet he took Mr. Post's machine and made three flights of five kilometers each, which qualified him to become a licensed aviator.

The closing day of the meet was cold and dreary but the four thousand who braved the elements in hope of seeing some flying were amply repaid.

Long cross-country flights by Ely and Mars were the features, although Augustus Post furnished further thrills about sundown, when in a closing flight he could not see a fence at one end of the field and landed astride it with slight damage to the plane.

During the meet the aviators flew every day as scheduled regardless of wind conditions, and Mars who was at the track a week in advance of the opening of the meet flew every day for fourteen consecutive days regardless of wind or weather conditions.

Wireless Messages Sent from Aeroplane.

The wireless experiments at Sheepshead Bay were conducted by H. M. Horton, former wireless expert and chief engineer for the De Forest Company. A receiving apparatus was placed at the top of the grandstand at the track and a sending apparatus was secured in the machine and placed just behind the seat. It weighed about 25 pounds. The sending of the message was done by J. A. D. McCurdy while in flight in his four-cylinder Curtiss machine. Mr. McCurdy was a wireless expert himself and will be remembered as one of the members of the Aerial Experiment Association.

BY J. A. D. M'CURDY.

"The telegraphic key was fastened to my steering wheel and was easily operated. For a ground wire from the machine, we used a wire about 50 ft. long, which, after I got well into the air, was thrown overboard and allowed to dangle behind the machine, with the one end fastened to the apparatus. The antena consisted of the guy wiring of the machine so that the whole system was very simple. I made certain definite signals (certain letters) which were easily picked up by Mr. Horton from his position on the grandstand. I flew away for a distance of about two miles and circled at an elevation of about 700 ft. and within this distance the instrument worked extremely well. So far as I know, this is the first time that such an experiment has been performed and now that it has been already done, it will probably be tried extensively by Governments abroad. Mr. Horton came up to Hammondsport from New York and he and I have been trying the wireless from the aeroplane here ever since, and have made very satisfactory tests."

WIRELESS ON AEROPLANE*

WITH A NOTE BY

Capt. Geo. A. Wieczorek, U. S. A.

THE question of whether or not wireless receiving set could be utilized to advantage on aeroplanes has been frequently brought up. So far as known, no attempt to use wireless in this manner has yet been made. At the Chicago automobile show a wireless system was installed in the army aeroplane which was used as an exhibit there, but it had never been operated during a flight. Successful results have been obtained operating a model dirigible, steering, stopping, starting, etc., by M. O. Anthony, as has been previously described in AERONAUTICS.

An inquiry was made by this magazine of Captain George A. Wieczorek, of the Coast Artillery Corps at Fort Terry, N. Y. In reply he says:

"Having followed the progress of wireless pretty closely for the past eight years, it appears to me that it would be rather difficult to get any practical result on account of the proximity of the spark in the cylinders of the engine. You see, the constant discharge taking place would set up a rattle in the receiver which would be practically continuous on account of the rapidity with which the explosions take place.

MAY GUIDE MACHINE BY WIRELESS.

"I believe, however, that it might be possible to arrange an apparatus on an aeroplane and to thus guide its movements from the ground some distance away. In Cuba several years ago I had an apparatus set up only a few feet from an engine which used an electric spark to ignite the gas in the cylinder and after a little practice I had no difficulty in reading signals from Key West, 96 miles off, while the engine was running.

"An aerial for receiving could be easily and cheaply rigged up on an aeroplane and the lead from it could be run through the receiver and grounded on the runners or steel spokes of the wheels."

* Set in type for the September number but crowded out.

Exhibition Flying About the States.

Warehouse Point, Conn., Aug. 17.—Charles F. Willard (Curtiss) made several flights here this day.

Bradford, Pa., on August 23, saw good flying by Willard. The grounds were exceedingly dangerous and the last flight ended in a damaged machine.

Greenfield, Mass., Aug. 27-29.—Willard filled the Greenfield date, with his large Curtiss machine making four fine flights, flying each day. He flew over the trees and the river and nearby settlements, and carried a passenger on two separate flights.

Hartford, Conn., Sept. 5-9.—The flying at Hartford was of the usual Wright efficiency and consistency, and the meeting was entirely satisfactory. Frank Coffyn filled the engagement with long and interesting flights.

Lincoln, Neb., Sept. 5-10.—Arch. Hoxsey (Wright) endeavored to fill a most difficult contract for flights between the hours of 10 and 12 in the morning, as well as two hours in the afternoon. He found a small infield of a half-mile race track surrounded entirely by barns, grandstands and trees, as a place for him to fly. In an endeavor, on the second day, to satisfy a large crowd, he went up successfully, but in landing was carried over against a barn and descended somewhat precipitately. He was not injured, but the main planes of the machine were badly damaged.

Minneapolis, Minn., Sept. 5-10.—Conditions very similar to those at Lincoln were found here. However, Hoxsey came on from Lincoln and flew, to the great satisfaction of all concerned, completing the engagement which was interrupted by Welsh's poor landing. The weather was bad and there was but three days of flying. J. C. Mars represented the Curtiss type of machine.

Milwaukee, Wis., Sept. 12-16.—Arch. Hoxsey pleased the crowds at Milwaukee, though handicapped by poor grounds. He made a spectacular flight on the opening day, going up 800 ft., cutting figure eights, diving, etc., in a 20-mile wind.

FLYING INJURES EIGHT SPECTATORS.

The flight of Hoxsey's Wright aeroplane at the State fair on Sept. 16 resulted in an accident in which eight persons, five women and three men, were injured. The machine swerved sidelong from its course above the racetrack and plunged into the crowd in front of the grand stand.

The aviator was uninjured and the aeroplane was only slightly damaged.

Parkersburg, W. Va.—P. O. Parmelee, a new Wright aviator, filled an engagement here between the 6th and 10th inclusive, as a part of a celebration of a home-coming week. Upon arrival, Parmelee found that the small racetrack was not very adequate for flying, and he therefore selected an outside field for some work. This fact, however, did not prevent him from doing all of the flying within the small track, with the exception of but one day. On the last day of the exhibition he flew down the Ohio River and out over the town, returning and landing within the small infield. The Parkersburg committee wrote daily, expressing their delight and wonder at the wonderful exhibition Mr. Parmelee was able to afford them.

OTHER EXHIBITION FLIGHTS.

Charles F. Willard filled dates at St. Johnsbury, Vt., Sept. 15, and at Holyoke, Mass., Sept. 17-18. On Sept. 5-6 Eugene B. Ely flew at Kalamazoo, Mich. Augustus Post was at Canton, N. Y., Sept. 13-16; J. A. D. McCurdy at Syracuse, N. Y., Sept. 12th.; E. B. Ely at Rock Island, Ills., Sept. 12-17.

Aviator Eells, of the Kirkham-Eells Aeroplane Company, at Bath, N. Y., made very successful flights before ten thousand people at the Naples, N. Y., fair on September 15 and 16. The machine, which is equipped with a Kirkham 25 to 30 h. p. 4-cylinder motor, gave evidence of extraordinary speed.

Chicago-New York Race.

There are ten aviators officially entered for the Chicago *Post*-New York *Times* Chicago-New York race for the $25,000 prize between the 8th and 15th of October.

Those entered are J. C. Mars, Glenn H. Curtiss and C. F. Willard, flying Curtiss machines, and either McCurdy or Ely in addition; Capt. Thomas S. Baldwin (Baldwin), James Radley of England (Bleriot), Todd Shriver (Shriver-Dietz), Joseph Seymour (Curtiss), Charles K. Hamilton (Curtiss type).

The winner of the $25,000 will be the man who first arrives in New York, provided he is there by the 15th. Starts may be made any time after sunrise on October 8th.

At Chicago, from the 1st to the 7th inclusive, exhibition flights will be conducted by the Chicago *Evening Post*, in which the competitors in the race itself are required to take part. The aviators will be given a percentage of the gate receipts. The first two days are open to anyone, but the remaining ones will be devoted to the flights of only those who are actually starting in the race. Sixty per cent. of the proceeds from these exhibitions will be given the aviators taking part in the race itself, as follows: The aviator who reaches New York first or the nearest point to New York in the time set for the race, will receive of this 60 per cent. a share amounting to 40 per cent.; the second best man gets 20 per cent.; the third, 15 per cent., and the remaining 25 per cent. is divided pro rata among other contestants, with the provision, however, that no one of these "also rans" shall get more than the 15 per cent. allowed the third man in the race.

International Aviation Tournament.

Arrangements for the international aviation tournament, October 22-30, have at last assumed definite form, and energetic effort is being made to make the big meeting at Belmont Park the most successful event of the kind ever given in America.

The subscribers committee has raised about $125,000 in popular subscriptions, and both the funds and the general business management of the meeting have now been turned over to the Aero Corporation, Ltd., which in turn has named several committees to take charge of the general work of organization. Allan A. Ryan is made chairman of the committee on arrangements and becomes the practical business head of the meeting. J. C. McCoy, as chairman of the committee on aviation, has charge of the programme, procuring of the aviators and all things that pertain to the sporting phase of the tournament.

Cash prizes to the amount of $50,000 are offered and in addition to this a profit-sharing arrangement has been decided upon whereby the aviators will get a large part of the net receipts of the meeting after deducting the necessary expenses. Under this arrangement the aviators will receive 70 per cent. of the first $100,000 net profits, and 40 per cent. of all sums over that. The managers are assuming that with good weather and normal attendance there will be something like $200,000 to be divided among the aviators under this plan.

General business headquarters of the tournament have been opened in the Fifth Avenue Building at Fifth Avenue and Twenty-third Street, and a force of experts and clerks are at work there putting things into shape.

Belmont Park is undergoing such transformation as is necessary to make it suitable for the airmen and the big crowds. All obstructions have been removed from the infield where a two-and-a-half kilometre course is being laid out for the general events. A five kilometre course for the Gordon Bennett trophy race will extend outside of the park to the east, but the start and finish of all events will take place directly in front of the grandstand.

The Gordon Bennett international race, which will doubtless be the banner day of the meeting, will occur on October 29, and the elimination trials for the selection of the American team will probably take place October 26. Coming as it does after the close of all other meetings here and abroad, it is expected that the list of entries for the $50,000 prizes will be large. Nearly two months before the opening of the meeting, it is said by the management, that applications had been received from a larger number of foreign and American aviators than have ever appeared at any American meeting, and by October 15, it is expected that the aviation committee will be able to close its books with as interesting a list of airmen as have ever appeared at any one meeting.

For the Gordon Bennett contest France has already named Alfred Le Blanc, Hubert Latham

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Complete Exhibition of Aeroplanes, Dirigibles, Sphericals, Parts, Supplies, Accessories and All Articles of a Kindred Nature

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ST. LOUIS NATIONAL AERO SHOW

Coliseum Building :: :: :: St. Louis, Mo.

and Rene Labouchere. England has officially named as the British team Claude Grahame-White, James Radley and Alec Ogilvie. In addition to these there are several other foreign aviators who have made application to be entered for participation in the general events. Henry Weymann and J. Armstrong Drexel, two well-known American aviators, have sent over from Europe their entries for the meeting, and it is quite likely that they will enter in the elimination trials for the Gordon Bennett. Glenn H. Curtiss, who brought the trophy to America, has been offered the privilege of heading the American team without taking part in the eliminatory trials, and if he accepts this offer it will intensify the rivalry among the other American aviators for the other two places.

Large sums of money are to be spent in advertising the meeting in all parts of the country, and the managers are preparing for the greatest crowds ever assembled for any sporting event in the vicinity of New York City.

Curtiss has still another new machine in the background in anticipation of the proper turning of the Aero Club tide for the international. Curtiss objects to entering into certain present arrangements as regards the race. If the Aero Club makes arrangements which, in his opinion will permit him with dignity to be one of the defenders of the cup, it is prophesied that Curtiss will be on the job with a machine expected to beat anything yet. In any case, it is probable J. C. Mars will compete in the expected elimination trials for the selection of the American team. There are available for this team those holding pilot certificates of the A. C. A., the self-constituted judge of one's ability to fly.

The following is a list of pilots to whom the Aero Club of America has granted aviation licenses up to September 1.

Glenn H. Curtiss.	Wilbur Wright.
Frank P. Lahm.	Clifford B. Harmon.
Louis Paulham.	Capt. Thomas S. Baldwin.
Orville Wright.	J. A. Drexel.

J. C. Mars made a successful attempt for an aviator's license at Sheepshead Bay, which license he will no doubt be granted at the next meeting of the governors. Tod Shriver has also complied with the rules.

Capt. Thomas S. Baldwin has begun the construction of an aeroplane in the anticipation of being one of those to defend the Gordon Bennett cup.

New York, Sept. 18.—The programme of events for the international meet at Belmont Park were announced today.

The summary of the programme for the meet follows:

Gordon Bennett International	$5,000
Gordon Bennett Elimination	1,500
Totalization of duration	6,000
Grand speed	4,500
Grand altitude	3,000
Fastest flight—ten kilometers	3,000
Passenger carrying	3,000
Cross-country	1,700
Cross-country passenger carrying	2,000
Kilometer straightaway	2,550
Total	$33,850
DAILY.	
Daily totalization of duration—8 days, $850 each	$6,800
HOURLY.	
Hourly altitude, 13 hours, $400 each	$5,200
Hourly distance—7 hours, $400 each	2,800
Hourly speed—5 hours, $400 each	2,000
Total	$10,000
General prizes	$33,850
Mechanics' general prizes	1,000
Daily prizes	10,000
Hourly prizes	10,000
Michelin prize	4,000
Scientific American trophy	.....
Total	$55,650

To better the present standing in the 1910 Michelin contest one will have to beat 244 miles and a duration of 5 hours and 3 minutes.

Aero Calendar of the United States.

Sept. 19-24—Detroit, Mich., Wright aviators.
Sept. 20-22—Pueblo, Colo., Hillery Beachey in Gill biplane.
Sept. 20-24—Allentown, Pa., to Philadelphia and return, J. A. D. McCurdy (Curtiss).
Sept. 21.—Olean, N. Y., flights by Willard (Curtiss).
Sept. 21-22—Roanoke, Va., E. B. Ely (Curtiss).
Sept. 22-28—Knoxville, Tenn., Wright aviators.
Sept. 23-25—Philadelphia, C. F. Willard (Curtiss).
Sept. 26-30—Trenton, N. J., Wright aviators.
Sept. 27-30—Rochester, N. H., Wright aviators.
Sept. 27-30—Poughkeepsie, N. Y., E. B. Ely (Curtiss).
Sept. 28—Montevista, Cal., Hillery Beachey in Gill biplane.
Sept. 28—Boston, Mass., Chas. F. Willard (Curtiss).
Sept. 26-Oct. 1—Helena, Mont., J. C. Mars.
Oct. 1-7—Chicago, Ill., exhibitions by entrants in Chicago-New York race, and by others.
Oct. 1-8—Springfield, Ill., Wright aviators.
Oct. 1-7—Sedalia, Mo., Wright aviators.
Oct. 5—Danbury, Conn., E. B. Ely (Curtiss).
Oct. 3-7—Washington, Pa., Wright aviators.
Oct. 3-8—Spokane, Wash., J. A. D. McCurdy (Curtiss).
Oct. 3-8—Richmond, Va., Wright aviators.
Oct. 4-7—Cumberland, Md., Hillery Beachey in Gill biplane.
Oct. 6-12—Birmingham, Ala., Wright aviators.
Oct. 8-15—Chicago-New York race.
Oct. 8-18—St. Louis, Mo., aviation meet in conjunction with the international balloon race; Wright aviators and others.
Oct. 12—Youngstown, O., E. B. Ely (Curtiss).
Oct. 17—St. Louis, Mo., Gordon Bennett balloon race.
Oct. 22-30—Belmont Park, L. I., international aviation meet, including Gordon Bennett aviation race, latter on Oct. 29.
Oct. 28-Nov. 1—Macon, Ga., Wright aviators.
Nov. 2-12—Philadelphia, Pa., aero show of Pennsylvania A. C.
Nov. 17-24—St. Louis, Mo., Coliseum aero show.
Dec. 1-8—Aero Show of A. C. of Illinois.

Thirteen Balloons in Indianapolis Race

Indianapolis, Ind., Sept. 17. Drifting northeast from this city are thirteen balloons. Nine of them are sailing to win a chance to represent America in the International Balloon Race at St. Louis, on October 17, and four were entered in the free for all event for a diamond studded cup.

Pilot John Berry of St. Louis, who won the American championship race last year in the balloon University City, entered in the free-for-all.

The National championship entrants are H. E. Honeywell, St. Louis, "St. Louis"; William T. Assmann, St. Louis, "Miss Sophia"; Louis von Phul, St. Louis, "Million Population Club"; J. H. Wade, Jr., Cleveland, "Buckeye"; Clifford B. Harmon, New York, "New York"; Alan R. Hawley, New York, "America"; Arthur T. Atherholt, Phila N. Y., "Hoosier," and C. G. Fisher, Indianapolis, delphia, "Pennsylvania"; Charles Walsh, Kingston, "Indiana II."

The free-for-all race entrants are Capt. John Berry, St. Louis, "University City"; H. W. Jacobs, Topeka, Kan., "Topeka"; Albert Holse, Cincinnati, "Drifter," and Dr. L. F. Custer, Dayton, "Luzerne."

International Balloon Race.

For the Gordon Bennett balloon race at St. Louis on Oct. 17, the following foreign entrants have been named:

Germany.—Hauptmann von Abereron, Lieut. Vogt, Ingenieur Hans Gericke.

Switzerland.—Colonel Schaeck and Captain Messner.

France.—A. Le Blanc and Jacques Faure.

Le Blanc was a French representative at St. Louis in 1907, and Von Abereron represented Germany. Col. Schaeck won the 1908 race for Switzerland, and established a world's duration record of 72 hours.

News In General

Lamson Issues Notice of Infringement.

Becker & Blakeslee, attorneys for Charles H. Lamson, of Pasadena, Cal., have sent out a letter to various makers and dealers in aeroplanes, demanding that the recipients cease making, selling or using flying machines. The principal claims of the patent, with drawings, were printed in the July, 1910, issue of AERONAUTICS. The letter follows:—

"This is formal notice to you of the issuance of Letters Patent of the United States, number 666,427, dated January 22, 1901, to Charles H. Lamson, which said letters patent you are infringing, in making, using or selling flying machines or mechanism or apparatus for navigating the air. We are directed by Mr. Lamson, the patentee, to demand of you and your agents, attorneys and servants, that you and each of them cease and terminate any such act or acts of infringement of said letters patent, or acts of infringement of said letters patent of any nature whatsoever, and that you and each of them respect said letters patent and the monopoly and rights thereby granted and awarded to said patentee. Suit for infringement of said letters patent is now pending against the Wright Company, of Dayton, Ohio, and further suits for infringement of said letters patent will in due course of time be instituted against other infringers; and the court will be asked to enjoin any such act or acts of infringement, and to award to said patentee the damages and profits involved in and flowing from any such act or acts of infringement, and to grant such further relief as may in each instance be proper and warranted by the facts.

"Pending adjudication upon said letters patent, and in order that no person, firm or corporation engaged in truly promoting the sport and art of aerial navigation may be barred or interfered with in such efforts, we are prepared to issue proper licenses covering the manufacture, use, sale and attendant activities involving the use of the invention covered by said letters patent. The initial payments on account of royalties or license fees in connection with the issuance of such licenses, will be nominal in each instance; and the payment of the balances on account of such license fees and royalties will be made conditional upon such adjudication of said letters patent as shall amount to a determination of the validity thereof."

"Very respectfully,

"BECKER & BLAKESLEE.

"Attorneys and Counsel for Chas. H. Lamson."

National Council of A. C. A. Issues By-Laws.

The National Council of the Aero Club of America has issued its first booklet. Full details of the organization of the Council have already been given in AERONAUTICS.

The clubs now belonging to the National Council pay $25 a year dues and $1 for each member. New clubs joining the Council must pay an initiation fee of $50 and $1 for each member. Though, if admitted between January 1st and July 1st, the rate is but 50 cents for each member.

It seems more than ever apparent that the whip hand is with the Aero Club of America, as one of its officers announced at the time of the formation of the new body. The by-laws provide that the chairman of the Executive Committee be named by the Aero Club of America, and in addition, the Club has the privilege of naming another voting representative; the other thirteen composing the Executive Committee being made up of the other members of the Council. The Executive Committee has complete control of affairs between semi-annual meetings of the Council, and the chairman exercises executive powers between meetings of the Executive Committee.

Following out the up-to-the-present-existing policy of the Aero Club of America, to have the whole say so far as possible in matters aeronautical, the plan of the National Council is to have but one club in each State a member of the Council; that club in turn to have affiliated with it the local clubs of its State. The exception is made, however, of the clubs represented at the organization meeting. As many clubs in one State or Territory as were represented, are now members of the Council.

The Contest Committee has made out a very complete set of conditions to be observed by those promoting meets, though there is no case on record where these have been complied with as yet. One particular rule of interest provides for the preventing of any performance by a contestant refusing to conform to the rules and regulations of the National Council, and the inflicting of penalties and disqualifications.

The Contract and License Committee is to keep in touch with the qualifications of all professional and amateur aeronauts and aviators and to seek to induce them to apply for pilot licenses.

The Academic Committee is supposed to be conversant with the work done by the various governments, schools and laboratories, and to co-operate with educational authorities "with power to receive donations and confer medals." The Aero Club of America has always been gratifyingly active in the awarding of medals, certificates of merit, the holding of banquets and participating in other strenuous labors. Perhaps the most important committee is the one on publicity, among whose duties is the furnishing of news items to the press.

Every affiliated club is entitled to one voting member in the Council, though another representative is provided for and allowed the privilege of attendance at all meetings and the right to debate but no vote.

Promoters of meets or exhibitions are asked to pay a fee of $100 to cover the first two days of the meet and $50 for each additional day.

Wheels on the Army Aeroplane.

Through the kindness of General James Allen, Chief Signal Officer of the Army, we are able to furnish some interesting details of the wheel arrangement on the Army aeroplane.

The original idea in equipping the machine with wheels was to employ a system whereby the wheels would be used for starting and both skids and wheels would be used in landing, thus minimizing the amount of reconstruction of the under structure of the machine, and reducing the wear and tear upon both wheels and skids in landings. This idea has been carried out with but slight modification and the results have been entirely satisfactory. Five wheels 14 in. in diameter are used. Four wheels in pairs under the machine (one pair for each skid), and one wheel in front to support the weight of the machine in front of the main planes. All wheels have the same dimensions, are interchangeable and are equipped with steel rims and 2½ in. single tube tires. Each pair of wheels under the machine are operated on a steel shaft 12 in. in length, connecting its two wheels. This shaft rests on top of the skid, and is held down in place by means of a vertical wooden block and two vertical tension springs. Across the top of the wooden block is a

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Have inaugurated to some extent the thought of *standardization* in aeronautic matters. They have evidently interested the aero man, for as a primary result, we have received large numbers of inquiries and orders. As a secondary result, we can show many testimonials from *men who are flying every day.*

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OUR PROPOSITION

If you know what you want, we will supply it. If you are not sure, we will assist you to decide. To get quick attention, enclose a small deposit, (10% usual). This gets your order on file. You know our prices from former advertisements.

IF YOU HAVE ALREADY

Used our propeller, write and tell us about it at once. Your experience will undoubtedly help others. We will print your letter under this heading:

MEN WHO FLY EVERY DAY

John J. Slavin Esq. of Los Angeles, Cal., says:

Los Angeles, Cal., 8/31/10.

To Requa-Gibson Company,
225 West 49th Street,
New York, N. Y.

Gentlemen:

Yours of the 26th inst. received, and in reply will say, that we have secured a 260 lbs. thrust with your propeller at 1,400 R. P. M.

I have made several short flights with the propeller, the longest being 200 feet, when I met with an accident which the enclosed clipping will explain. I then wired you an order for a 7 ft. propeller.

I can honestly recommend your propeller to anyone wishing to secure an efficient propeller, and take pleasure in giving you this testimonial.

Very truly yours,

1645 Maple Ave. J. J. Slavin.

(NOTE: The above propeller used was a 6 ft. Dia., by 4 ft. pitch.)

Captain T. S. Baldwin of New York, says

AIR BALDWIN'S "California Arrow" SHIP

New York, July 9th, 1910.

To The Requa-Gibson Company,
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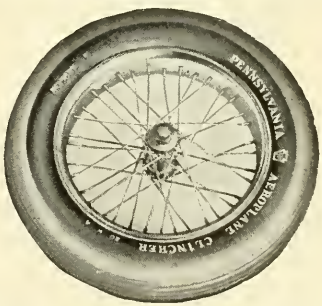

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SIZE	Weight complete
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26x2½ "	6½ "
28x2½ "	7½ "
28x3 "	8 "
28x3½ "	8¾ "

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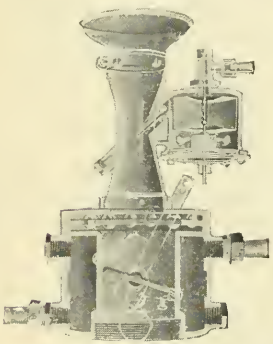

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flat steel rod with ends turned up into which the ends of the springs are fastened. The other ends of the springs are fastened to the skid by means of metal bands. The two vertical springs and wooden block are enclosed within a light galvanized iron casing to prevent the springs and block from distortion due to lateral strains. In addition to the heavy vertical springs, four horizontal springs are employed to minimize the horizontal torque on the wheels resulting while running on the ground. These springs are attached to the shaft so that one pair exerts tension toward the rear, while the other pair opposes this tension. The single wheel in front is provided with two pieces of flat spring steel which constitute a fork for the wheel. The pieces of spring steel are fastened to a cross bar and guyed in four directions with steel wire to prevent movement in any direction. These pieces of spring steel are designed to support a weight of about 80 pounds under a 7 inch deflection. This weight being sufficient to force the skids to the ground. The operation of the machine as regards the use of wheels is as follows:

With the engine running and the machine held stationary, the front end of the skids are forced to the ground, due to the high thrust of the propellers. Upon releasing the machine it moves forward slowly at first. As soon as the front plane is elevated, the air pressure under the elevating plane raises the front skids and allows the front wheel to do its work. As soon as the momentum of the machine increases the weight of the machine upon the vertical springs decreases until finally all the wheels leave the ground. Upon

The Latest Gill Biplane.

The Howard W. Gill Curtiss type biplane which made its first appearance, with successful flights, driven by a stock 26 h. p. automobile engine, at the Los Angeles meet, has been taken over by the St. Louis Aeronautic Supply Co.

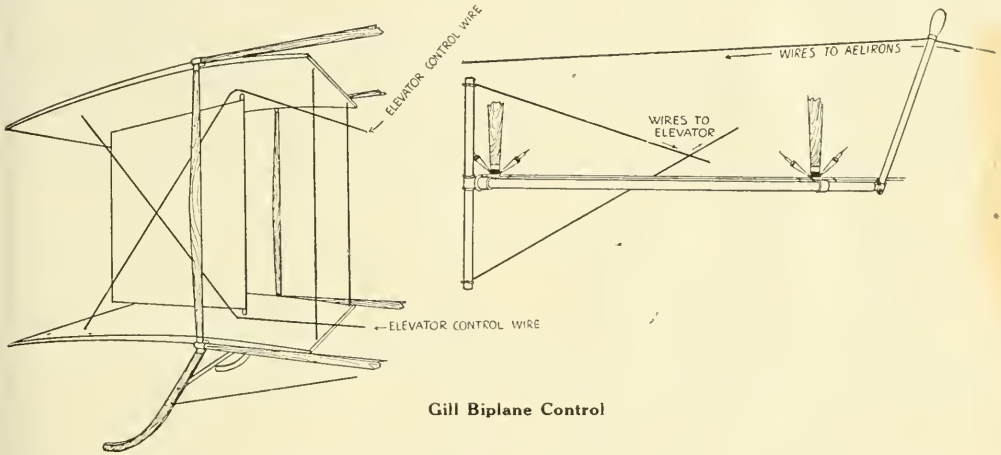
The later type Gill machine, on Farman lines, and without any front rudder, has started on an exhibition career with Hillery Beachey as aviator.

The vertical control of the Gill biplane differs from other biplanes by its location in the rear of the machine, where it also acts as a steadying plane as well as an elevator.

As will be seen from the drawing it consists of two superposed planes which are pivoted slightly in front of their center of pressure about one-third of the distance from the front edge, both of which planes are connected front and rear by upright wires so that they work in unison.

To give added security the wires controlling the elevator are in duplicate and besides a safety wire is also placed in the rear plant. As these planes are hinged forward of their center of pressure should anything happen it would have the same effect as the operator taking his hand off the controlling lever in which event the rear planes would point down and start the ship climbing upward, in this case the safety wire comes into effect and only allows the machine to climb at a safe upward angle, so that by slowing down the motor the machine can be brought naturally and safely to the ground.

A landing of this nature was made necessary in the experimental stages at Los Angeles, Cal.,



Gill Biplane Control

landing, the machine is guided so as to land upon the front wheel. Under the force of impact the front wheel is deflected upward, allowing the skids to strike the ground. The pairs of wheels under the machine as they strike the ground are forced upward, allowing the skids to strike the ground. The reaction of all the springs after the initial impact raises the machine and allows it to run along the ground until it comes to a full stop.

One of the most unpleasant features in landing on wheels is the difficulty experienced in stopping the machine after landing. This is extremely vital, particularly when landing in a small enclosure. This difficulty has been practically eliminated by means of the flexible front wheel and the use of the front elevating control. Upon striking the ground the front control is depressed, the air pressure on top of it being sufficient to hold the skids on the ground, thus bringing the machine to a full stop in nearly the same space as was formerly the case when using the skids alone.

During the month of August Lieut. Foulois made several short flights, aggregating in time 75 minutes and 43 seconds. These flights were merely experimental, and for purposes of testing out the new system of control and the new system of wheels.

through a broken wire, and was made without any breakage to the machine, and in such a natural way that those who witnessed it were unaware until told.

A hand-lever placed on the right side operates the vertical control. A forward movement increasing the angle of incidence in the rear tail which raises the tail and steers the biplane downward. Pulling back on the lever reverses the movement and steers the machine upward. This same lever also controls the ailerons. At first it was hinged in a universal joint to secure both the forward and sideway motions. This was afterward changed to the T-joint shown as it was found to give a better control than by pivoting the lever on a universal joint. In the improved joint both the forward and sideway movements are more positive and distinct. With this new type lever a movement of the ailerons can be made without any tendency to work the elevator also, or vice versa.

At first the rear elevator was found to have a decided lag, a movement to raise the ship would apparently have no effect, which made the operator feel that the lever had not been moved sufficiently to raise the machine and generally resulted in and increased movement of the lever then as the flyer

would start rising due to the first movement the lever would be pushed forward to carry the machine level when on account of the ship still rising it would seem as if it was beyond control. By increasing the surface of the rear tail and reducing the weight this lag, nearly always apparent in an aeroplane controlled vertically from the rear, was to all practical purposes eliminated.

As it is necessary for good stability to have a machine with a rear plane it is a big advantage to use this tail as an elevator also. To leave off the front elevator not only makes a lighter machine by some 40 to 80 pounds, but makes the rest of the ship stronger by its not having to stand this added weight, on account of their being no obstruction in front. In case of an accident the operator is less liable to be caught under the machine and crushed. It is bound to make a faster and therefore more stable flyer by the elimination of the head resistance of the front planes and their supports.

Wellman Airship.

Rapid progress is being made toward the preparation of the Wellman airship "America" for its promised attempt to cross the Atlantic. Since the last start for the pole on August 15, 1910, the airship has been enlarged and improved and an entirely new steel car placed under it. It is anticipated that the voyage across the Atlantic will require from six to ten days, depending on the force of the prevailing winds.

Trials will be made at Atlantic City in which the equilibrium will not be used, sand and water ballast being employed instead. These trips are to test the machinery and get everything in running order.

The "America" is the second largest airship ever built, and next to the Zeppelin in size, but has a larger carrying capacity than the Zeppelin. The ship has been built and perfected in Paris under the direction of Walter Wellman, and the personal supervision of Chief Engineer Vaniman, who designed most of the ship and constructed many parts and accessories.

FACTS ABOUT THE AIRSHIP "AMERICA."

Length of Balloon.....228 feet.
Greatest Diameter..... 52 feet
Volume.....345,000 cu. ft.
1 cubic foot of air weighs 1 1/5 oz.
345,000 cubic feet of air weighs 25,800 pounds.

The balloon is inflated with hydrogen gas generated by using eighty tons of sulphuric acid and sixty tons of iron turnings. The gas is washed and dried to make it as light and pure as possible. This gas weighs one-tenth of an ounce per cubic foot and the 345,000 cubic feet required to fill the balloon weighs 2,150 pounds, the gas being twelve times lighter than air. The lifting force of the balloon therefore is the difference between the weight of the air displaced and the weight of the hydrogen with which the balloon is filled. The total lifting force of the "America" is 23,650 pounds.

The balloon itself, composed of three thicknesses of cotton and silk gummed together with rubber to make it gas tight, weighs 4,850 pounds. Underneath the balloon is suspended by steel cables the car, which weighs 4,400 pounds. This car is built of the highest grade steel tubing and in places withstands stresses of twelve tons. The car is 156 ft. in length, and the steel tank at its base is 75 ft. long with a capacity of 1,250 gals. of gasoline. The engines, three in number, (two of 80 h. p. and a service motor of 10 h. p.) are placed in the steel car. Each of the large motors drives a pair of twin screws, and each propulsion system is independent of the other. The motors and other machinery weigh about 1,500 pounds. Sleeping quarters are provided the crew of six men in the triangular parts of the car. An electric light system, a wireless telegraph equipment and a telephone connecting the different parts of the ship are being installed.

A specially built life-boat, constructed in England, will be swung underneath the car, fully equipped with provisions, water and instruments to be used by the crew in an emergency. This life-boat weighs less than 1,000 pounds.

Hanging from the airship by a strong steel cable is what is known as the "equilebrator," a part of which will float upon the surface of the sea, the other being suspended vertically in the air. The purpose of this is to act as an automatic regulator of the upward and downward movements of the airship. When the ship rises, it must lift some of the equilebrator from the surface of the sea in order to go up, and this added weight checks the rising movement. Conversely, when change of temperature or accumulation of moisture causes the airship to descend, a greater part of the equilebrator is let down upon the sea, thus reducing the weight carried by the balloon and checking the descent. The equilebrator is composed of thirty steel tanks containing gasoline and strung together by a strong steel cable. The gasoline thus carried is a reserve supply for the engines.

The total supply of gasoline carried will be 10,000 pounds, or about 1,800 gallons, which is considered sufficient to drive the airship from Atlantic City to Europe. The distance is about 3,000 miles. With one engine running, the airship will have a speed of twenty miles per hour, and the quantity of gasoline carried would run one engine 200 hours. With both engines running, the ship's speed in still air will be about 26 miles per hour.

Patents.

Fred Lincoln Gould, Reno, Nev., assignor of one-quarter to John H. Dodd and one-quarter to Ambrose M. Smith, Reno, Nev., 986,452, July 26, 1910, filed Feb. 5, 1909. FLYING MACHINE of the helicopter type comprising two vertical masts, one rotatable with the other, and each carrying a parachute having apertures therein, with blades set in the apertures. Means are provided to rock the blades so as to present different angles of incidence or close entirely the apertures in the parachute.

Clifford Broderick Cronan, Shelburne Falls, Mass., 965,622, July 26, 1910, filed Feb. 17, 1909. FLYING MACHINE consisting of a main frame and a skeleton frame arched in its upper portion and covered with thin pliable covering. The skeleton frame is so constructed that it may be rocked longitudinally and laterally. There are planes and propellers on vertical axes within the structure for sustention.

John G. Stites, Willowbrook, and Frank Stites, Los Angeles, Cal., 965,491, July 26, 1910, filed March 24, 1910. FLYING MACHINE SUPPORTING PLANE. A double canvas surface sewed in such manner as to provide longitudinal and transverse pockets. "Rafters" are inserted into the side longitudinal pockets while a "ridge pole" is inserted in the intermediate longitudinal pocket and "ribs" are inserted into the transverse pockets.

John Law Garsed, Elland, England, 965,289, July 26, 1910, filed Nov. 11, 1909. Apparatus for operating planes or wings and rudders of aerial machines. Two shafts are arranged end to end and are provided at their adjacent ends with bevel gears into which a miter gear meshes, the latter provided with a hand wheel. In addition to the rotation provided by the above there is also a handle attached to a rocking frame suspended from the shafts and foot pieces applied for giving slight rotary or oscillating motions to shafts.

Leonidas Hamlin Barringer, Charleston, W. Va., 965,682, July 26, 1910, filed May 29, 1908. AIRSHIP, the characteristic feature of which lies in an open ended casing or cylinder extending centrally and longitudinally through the cigar-shaped gas bag. The cylinder is held in place by partition secured to it and to the envelope and these partitions serve in addition to form separate gas containing compartments. The usual car is suspended from the envelope and transmission means are provided to rotate propellers in the central casing or cylinder.

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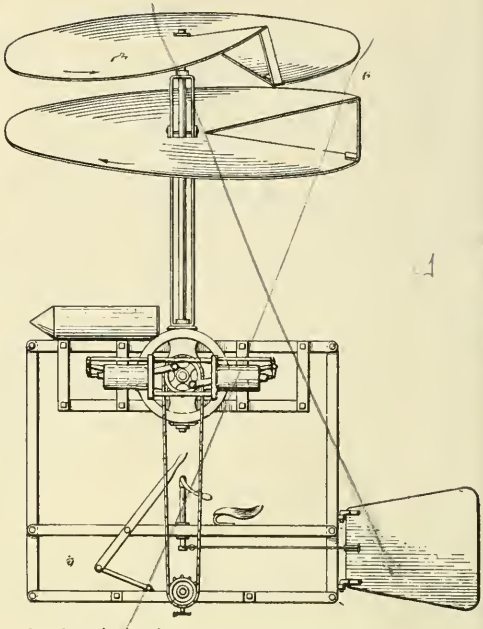

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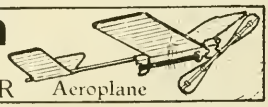

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Show in Washington.

Under the anspices of the Aero-Scientific Club of Washington, D. C., an aero exhibit will be held at the Union Station, in that city, week of October 3d.

An invitation is extended to all persons having new ideas, inventions, flying machines or any aero appliances to exhibit. There will be no expense to exhibitors, beyond transportation.

Will also hold amateur aero meet at College Park, near Washington, opening October 17th, and continuing ten days. All exhibitors having machines here on exhibition can have full week for try out and practice work at College Park aviation field and grounds, before the meet, thus becoming familiar with field and grounds and be able to make credible showing at the meet.

All persons who desire to enter exhibit or wish particulars in regard to meet, communicate with F. L. Rice, secretary, 614 19th street, N. W., Washington, D. C.

Philadelphia Aero Show Changes Date.

The aero show which has been announced by the Aero Club of Pennsylvania, to be held in the First Regiment Armory, Philadelphia, has been postponed a few days and will now be held November 2 to 12.

This postponement has been found necessary because a number of the aeroplanes which will be on exhibition and which will be the principal attractions for the public will be competitors in the Belmont Park meet, and as these races have been put off until October 22 to 29, the arrangements have been made to open the show on the Wednesday following, thus giving plenty of time to ship the machines from Long Island to Philadelphia and to set them up in the Armory.

In response to a number of requests from exhibitors who are also going to show their goods in St. Louis, the A. C. of P. is arranging to have a special car engaged to be packed with goods from the Philadelphia show immediately on the close, November 12, and to send this car by express to St. Louis, so that the exhibit can be set up there in time for the opening.

The Philadelphia show is attracting unusual interest among dealers in aeronautic and aviation supplies because of the activity that has been recently shown by the Aero Club of Pennsylvania. This organization has now gone into ballooning with weekly ascents scheduled. Its new grounds for aeroplane flights at Clementon, N. J., have been pronounced by those who have seen them to be far ahead of most other grounds, both in their natural advantages and in the building which has been done on them.

The hangars on these grounds are three hundred feet long and so constructed that there are six separate compartments, each 50 ft. wide and 40 ft. deep, and each containing a work-bench and two sleeping compartments, to accommodate four persons. The club is also installing a complete machine shop to be run by a 5 h. p. gas engine, and the fact that every one of these hangars has already been leased for the entire winter is an indication of the busy days that are in store for members of this organization.

A large percentage of the space in the Aero Show has already been taken by residents of eastern Pennsylvania, Southern New Jersey and Delaware, of which Philadelphia is the natural center, these residents having turned in remarkable numbers to the manufacture and sale of aeronautic and aviation goods. The recent growth of the Aero Club of Pennsylvania has been one of the most notable features of American aviation news and the club is being run upon a business basis which promises well for its future.

The "Three States Aero Show" has been placed by the club under the management of Henry M. Neely, the secretary, who is also chairman of the committee on contests and exhibitions, and who has had many years' experience in show management and publicity.

St. Louis National Aero Show.

Preparations for the St Louis National Aero Show, to be held November 17 to 24, in the great Coliseum in St. Louis, under the auspices of the Aero Club of St. Louis, are rapidly progressing. The manager now believes there will be on exhibition from 12 to 15 full size aeroplanes and 40 or 50 flying models.

More than 35 concerns have already contracted for space at the show, among these are: AERONAUTICS, Detroit Aeroplane Company, Aeronautic Supply Company, Goodyear Tire & Rubber Company, Aeromotion Company of America, Aerial Navigation Company of America, Leading Brass Company, French-American Balloon Company, Missouri Stair Company, St. Louis Pattern & Model Company, United Storage & Battery Company, Lawson Publishing Company, Phoenix Auto Supply Company, Western Oil Pump & Tank Company, O. K. Harry Steel Company, Erker Bros.

Among the complete aeroplanes to be shown will be a Wright machine which will occupy the place of honor at the main entrance, a Farman biplane, a Santos Dumont "Demoiselle," Gill biplane, Curtiss biplane, Baldwin biplane, and several other machines that have recently tried out, but have not yet made important flights.

A novel exhibit will be that of the Missouri Tent & Awning Company, makers of aeroplane hangars, which will show a model aviation field with a miniature grandstand, hangars and aeroplanes. Among the flying models there will be a novelty in the form of a ornithopter, which actually flies in much the same way as a humming bird.

The spaces devoted to the exhibits of inventors or those who will show plans, or specifications, or models of aircraft, in which they desire to interest capital, are rapidly filling up.

G. L. Holton, manager of the show, with offices in the Coliseum building, reports that there is very little space left in the Coliseum and urges manufacturers who plan to exhibit there to advise him at once.

BALLOON TRIP OVER ROME

(Continued from page 111)

I was seven hours on my voyage from Rome to Benevento, going over the Apennines, where I was well received by the Italians, who praised me very much, because I had courage to defy the Pope, who then had a bitter feeling for some cause against our nation. Several persons hailed me on my way, and were highly delighted to see a great balloon pass over their heads. I made the voyage of two hundred miles in the year 1869 from Rome. My American and English friends presented me with a splendid flag in Rome, which they desired to see me wave over the city.

At that time only the Pope's flag was allowed to float over the Eternal City, by orders of the Pope (Pius the Ninth) who reigned over the city. His secretary, Antanelli, and Governor Randi, said I must not carry the Stars and Stripes over Rome. On my third ascent I put my flag in the car, and as I began the ascent I took off the Pope's flag and put in its place the Star Spangled Banner and waved it in triumph. A tremendous shout from Americans and British and the admirers of Garibaldi was given as I sailed off towards the beautiful city or villa of Tivoli at the foot of the splendid Apeanines.

I had to give away half the money received at the villa of Borghese, an immense garden belonging to Prince Borghese, who married Pauline, the sister of Napoleon the Great. About four thousand dollars was taken at the gates. Garibaldi and Crispi were my friends, and seemed highly delighted with my courage and defiance of the Pope and Roman powers.

At Naples I received my fifteenth degree in Freemasonry at the Garibaldi lodge. In the masonic lodge at Palermo, where M. Crispi was the grand master of the lodge, I heard him and others speak in favor of taking Rome by Garibaldi. The poet Longfellow and the Queen of Naples were among the twenty thousand people who saw my ascent at Rome.

IN THE AERIAL MARKET PLACE

TO OUR FRIENDS—We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

New High Powered Engine.

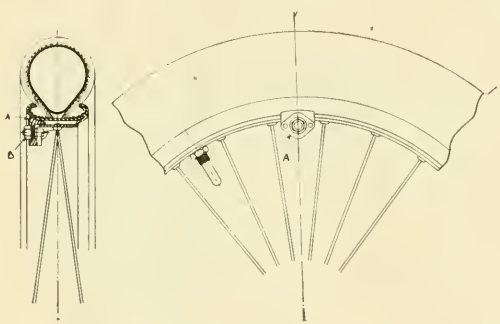
Owing to the demand for high powered engines of 60-75 or even more horsepower, the Detroit Aeronautic Construction Co. is contemplating putting on the market an 8-cylinder engine. Their largest motor at present is a 6-cylinder, 5 by 5, weighing complete about 285 lbs., rated at 60-75 h. p.

Bosch Chicago Office Moved.

The office and headquarters of the Chicago branch of the Bosch Magneto Company has removed from the former address at 1253 Michigan Avenue, to 119-121 East 24th Street. A two-story building midway between Michigan and Indiana Avenues.

Demountable Rims for Aeroplanes.

The Dorian Remountable Rim Co. has brought out a demountable aeroplane rim. The principle of the construction and operation of the aeroplane rim is the same as that of the automobile rim, the chief difference being that the felloe band of the automobile rim is shrunk on the wood felloe of the automobile wheel, while with the aeroplane rim, the wire spokes of the wheel are secured in the joint as per the general practice.



The five wedges of the aeroplane rim are made of aluminum alloy, and the rims on which the tire is fitted is of rolled sheet aluminum; the felloe band is of steel.

The difference in weight between the rim and a regular clincher rim is about 5½ pounds per wheel.

To remove the rim with the deflated tire so that the rim with a properly inflated tire can be fitted in its place, it is necessary to merely remove three of the wedges by turning the nut "B," which is held in the wedge by a plate so that it virtually forms part of the wedge; for this reason, it is impossible to lose a nut. The band to which the spokes of the wheel are secured is made of an alloy steel, and the rim holding the tire is made of steel aluminum alloy rolled to shape.

On Two-Cycle Engines.

At last even conservative Mineola, the hotbed of aviation in the East, has come to accept the two-cycle engine of modernized type as one solution of the power problem for consistent aeronautic work, and none of the novice aviators there feel their chances for achievement are good without the now popular two-cycle engine.

In the Western States they found favor months ago, because Western users of gasoline engines know that all their fastest motor boats for the past two or three years have been driven by light-weight two-cycle engines. And the winning of a great motor boat even demands from the power plant just what successful flight calls for,—an engine very light for its power, very simple in design, and one capable of turning a propeller at a high speed for considerable periods of time.

Automobile work is entirely different; the motor must pull hard in starting or climbing hills, but runs practically free on level ground,—except where extreme high speed is maintained. Practically no "stock" automobile motor will stand maintained high speed; it overheats, connecting rod bearings pound to pieces, or, most frequently, the valves warp and fail. The motors simply are not designed for indefinitely long runs at maximum speed, consequently no really successful flight has been made in America with an automobile engine. Two-cycle motors have been successful in motor boat work simply because they have been designed and perfected with but two ends in view, power for weight and long continued high speed.

Mineola, however, knew little about boats or boat engines. Most of the men who formed the colony were graduates from the automobile school and they were sceptical concerning the alleged merits of the two-cycle engines.

"Nothing to it," they said at first, and then Dr. W. Greene made a couple of get-aways early in the season.

Dr. Greene's flights proved that the engines would fly, so Mineola had to leave the general and come to the particular.

"Two-cycle engines are difficult to start," said the "boys"; but G. E. DeLong brought his Schneider 'plane to Mineola with an Elbridge two-cycle engine, started it in two minutes the first time and on the spark whenever he liked for the rest of the day. The doubting Thomases were beginning to scratch their heads.

"But you can't keep a two-cycle engine cool with an ordinary radiator," they exclaimed, when a 26-h. p. radiator attached to a 50-h. p. engine boiled over after a ten-minutes' run. Two or three days later J. J. Frisbie installed a four-cylinder Elbridge in his 'plane, used two small radiators so placed that they received an uninterrupted current of air, and not only did the two-cycle engine cool properly, but it was the only engine on the aviation field that could be run for twenty minutes at a stretch (standing) without boiling over.

"That's a nice little engine," said Captain Baldwin to Frisbie, when the installation had been made and Frisbie was preparing for his trial flight, "but a man needs more power to fly with than you can get from four small cylinders."

"Great Scott! That's too much power for a novice to monkey with," said Captain Baldwin five minutes later, as Frisbie sailed by at a speed approximating fifty miles an hour.

"Anyway, you can't throttle down a two-cycle engine," was their final wail, quite refuted by different users, who throttled down the engines in their machines so well that the 'planes could be left standing alone with their propellers slowly turning.

That was the last straw, and the crowd bolted for two-cycle engines of the "Featherweight" type. George Russell, who has been using a four-cycle engine all summer installed a two-cycle and went away to fill an engagement. Frisbie, in three weeks, had learned to fly so well that he threatened the laurels of men who have spent more than months learning to fly, and he found easy money reaching out to him. Some half-dozen others followed suit, until now there are more of one make of two-cycle engines being installed at Mineola than all different four-cycle makes combined.

There now are literally dozens of them around New York. Their chief beauties seem to be strength, power and smooth-running. They have been in smash-ups of all kinds, but not a part of any one of the engines has been broken. Several

men report leaving the ground inside of 100 feet, which speaks well for their reserve power, and in summing up the operation of the engine the *Evening Sun* of August 30 says it "runs like an electric motor."

At Buffalo on Labor Day an Elbridge "Featherweight" installed in the boat Elbridge V. won the $500 Buffalo Launch Club trophy for the 25-mile championship of the Great Lakes, under conditions so adverse that none of the other boats, mostly equipped with four-cycle engines of 250 to 300 h. p., finished the race.

Even Europe has fallen victim to the seductions of the simple two-cycle engine, there are several new makes on the English market, and the American manufacturers of the Elbridge "Featherweight" engines are said to have declined to entertain a proposition guaranteeing $50,000 per year for European manufacturing rights.

Finest Workmanship Displayed on Burgess-Curtis Biplanes.

The Burgess Company & Curtis has good reason to be gratified by the many compliments the machines received for their construction and unequalled finish. Several of the aviators at the Boston meet have requested this concern to furnish them with spare parts or construct machines for them. The new 8-ft. propeller designed by W. Starling Burgess has attracted particular attention ever since it developed a thrust of more than 460 pounds. While the power to produce such an enormous thrust was primarily due to the excellence of the eight-cylinder Indian motor, it is nevertheless greatly to the credit of the propeller itself that the power should be applied so efficiently.

IMPORTING CLEMENT MOTORS.

The Clement-Bayard motors, which this company is importing direct from the manufacturer, can be supplied at $1,500 each. These motors when tested by Bleriot's engineers developed from 25 to 31 h. p. continuously and weigh less than 110 pounds. The well-known reputation of the Clement-Bayard factory is back of them.

The Burgess-Curtis machines at the Boston meet did not show up so prominently for unavoidable reasons. A 60 h. p. motor for the Burgess biplane owned by Messrs. Shoemaker and Hilliard arrived only at the last moment before the meet, and Mr. Hilliard has required a large amount of testing and adjusting in order to adapt the heavy motor and its 8-ft. propeller to a machine designed for a light 25 h. p. motor using a 6-ft. propeller. Then, again, the Clement-Bayard motor for the Model C machine arrived only the very day on which the Model C was shipped to the aviation field. There were many delays in getting the motor set up and properly provided with radiator and other accessories.

In view of the fact that the company has not yet succeeded in securing the services of an experienced aviator, Mr. Burgess recently decided to undertake flying one of the Model B machines himself. He has shown considerable proficiency in making short jumps on an even keel, but as he keenly realizes that any damage resulting to the machine from faulty handling on the part of the aviator would be attributed by the public to faults in the biplane itself, he is pursuing a conservative policy and making progress slowly.

Goodyear Four-Inch Tires.

Large size tires are coming more into favor, as they deserve. They ride holes and ruts in fields where small tires catch and buckle the wheels.

The Goodyear Tire and Rubber Co. is now making 20 x 4-in. detachable and 20 x 2-in. single-tube tires, and expects to increase its facilities in this line shortly.

The Anzani Aviation Motor.

The 3-cylinder Anzani motor, which, since an agency was started in the United States, has already sold well, is made in five sizes, ranging from 10 h.p. to 45 h.p. Specifications of these motors follow here below.

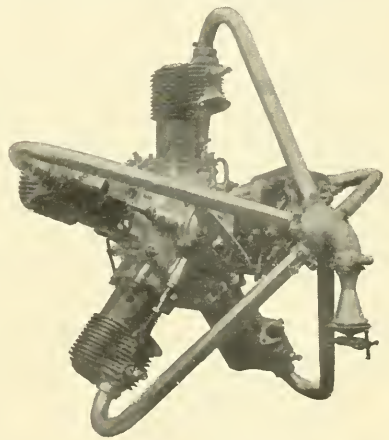
The cylinders are radially disposed and are placed at an angle of approximately 60 degrees. Assuming that the cylinders are numbered one, two, three, the explosions will take place first in number one cylinder, then in number three and finally in number two. This distributes the explosions evenly over the circumference, which insures almost perfect balancing of the engine. The cylinders are cast in steel separately, the valve chamber being solid with the chamber wall.

The valves are of the well-known mushroom type of nickel steel; the inlet valves are operated automatically and are situated at the top of the cylinders, while the exhaust valves are located at the side of the cylinders and are operated from a single timing gear.

The air cooling as used for the Anzani motors has proved very efficient. As the motor runs all the time at top speed a tremendous circulation of air is obtained, which insures perfect cooling. Even if the motor is installed in the rear of the machine, the suction caused by the propeller is sufficient to create a draught, which in itself will cool the motor.

The pistons are cast in steel, and are extra light. The connecting rods are attached to a single throw of the crankshaft. The crankshaft is made of nickel steel and is balanced by counterweights, which are taking the place of the flywheel. No camshaft is used and a pinion is attached to the end of the crankshaft, which drives the timing gear, oil pump, and ignition timer.

The G. & A. carburetors have been adopted for the Anzani motors and an extra light model specially constructed for aviation is used. The carburetor operates entirely automatically.



The ignition by 6-volt storage battery and high tension multiple unit coil or by high-tension Bosch magneto.

Splash lubrication. The oil is distributed through all parts of the motor by means of a rotary oil pump.

All motors are fitted with a thrust bearing, which is placed outside of the crankcase, in case a pushing force is required, and inside of the crankcase when a pulling force is needed.

After the success obtained with the 3-cylinder motor Anzani decided to construct also 4 and 5-cylinder motors. The 5-cylinder motor has proved quite a success. This motor is furnished either in 50 or 100 h.p. The same principles of construction of the 3-cylinder motor have been followed for the 5-cylinder. The cylinders are equally distributed over the circumference. Special attention has been given to the lubrication system and the oil is forced by means of a pump through a system of piping to all the bearings of engine.

Anzani is one of the pioneers in the manufacture of aviation engines, and Bleriot's success in crossing the English channel with an Anzani engine established an enviable reputation for this engine.

Among the famous aviators which have used the Anzani engine we can mention the following: Bleriot, Delagrange, Morave, Molon, Olieslaegers, Leblanc, Masnet, de Lesseps and Balsan.

The following machines have been from time to time "Ansani installed:" Bleriot, Hanriot, Tellier, Vendome, Nieuport and Dubonnet.

AERONAUTICS' PERMANENT EXPOSITION

EVERY day there are visitors to the PERMANENT EXPOSITION, wanting to see this motor or that, tires, magnetos, propellers, et cetera.

The scheme has not been a complete success, by reason of the very fact that some advertisers are too successful in getting orders beyond the immediate supply. Not a single motor has yet been shown in the exhibition room.

Within the last week there have been added several most interesting exhibits, among them a propeller of the American Propeller Co., the Pennsylvania tire exhibit, a sample board of Roebling wire and cable, H. M. H. Mills cloth, Rubel Co. wood, Goodyear fabric, Vacuum Oil Co., etc.

The value of the exhibition to all is at once apparent, and every manufacturer is earnestly asked to send in sample products just as soon as it is at all possible.

Manufacturers should send a supply of their catalogues and print on their circulars, stationery and letters the fact that they are exhibitors in AERONAUTICS' PERMANENT EXPOSITION.

Every reader of AERONAUTICS is invited to call and inspect the exhibition.

Exhibits are either on hand or promised from the following:—

Hartford Rubber Works Co.	Tires
Wittemann Bros.	Gliders and Supplies
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Roebling Co.	Wire Cable
El Arco Radiator Co.	Radiators
J. A. Weaver	Wheels, Etc.
Greene Co.	Propellers and Parts
Bosch Magneto Co.	Magnetos
Auto-Aero Supply Co.	Supplies
R. I. V. Co.	Ball Bearings
J. Deltour	Bamboo
J. S. Bretz Co.	Magnetos, Bowden Wire
Aero Supply Co.	Supplies
Charles E. Dressler	Model Maker
Wm. P. Youngs & Bros.	Lumber
Buel H. Green	Turnbuckles
American Propeller Co.	Propellers
Vacuum Oil Co.	Oils
H. M. H. Mills	Cloth
Goodyear T. & R. Co.	Cloth
R. O. Rubel, Jr., & Co.	Woods and Joints

A SIMPLE WAY TO DRAW A PARABOLIC CURVE

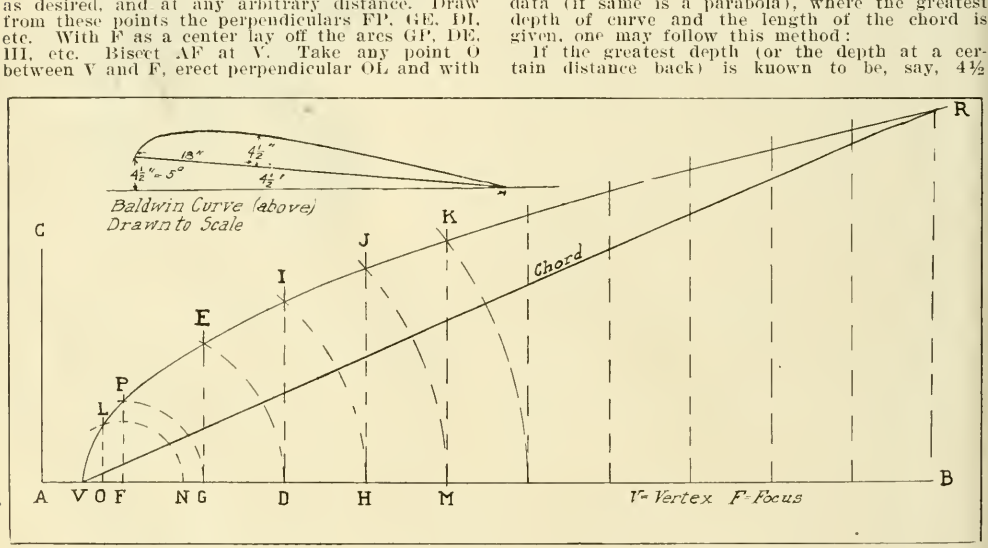
TO construct a parabola (in a simple manner) draw the line AB; and AC perpendicular to it. On AB lay off the points, equidistant, F, G, D, etc., as many or as few as desired, and at any arbitrary distance. Draw from these points the perpendiculars FP, GE, DI, etc. With F as a center lay off the arcs GP, DE, HI, etc. Bisect AF at V. Take any point O between V and F, erect perpendicular OL and with F as center and OA as radius cut OL at L. AO = FL. Then VLPE, etc., are points on curve. Draw a "fair" line through the points L, P, E, I, etc., and you have your curve. The chord VR may be drawn between any points, dependent upon the depth of curvature and place of greatest depth desired. Other methods may be found in text-books. The degree of curvature depends on the arbitrary distance AF, and this distance must be selected to give the desired curvature.

A parabola is defined as a curve, any point of which is equidistant from a *given line and a given point*. The given line is AC and the given point F; and all points on curve must be equidistant from these two. Hence, all radii must be taken from F. FE = AG, FJ = AH, etc.

To duplicate a particular rib from printed data (if same is a parabola), where the greatest depth of curve and the length of the chord is given, one may follow this method:

If the greatest depth (or the depth at a certain distance back) is known to be, say, 4½ in., and the chord is 4½ ft. (54 in. divided by 4½ in. = 1 in 12), lay out a trial parabola, as shown in sketch, using some arbitrary distance, say, 3.6 in., for AF. When complete take a straight-edge 4½ ft. long and move along the parabola until a T-square laid on the straight-edge will show the necessary depth at the required point. If incorrect redraw, using another distance for AF.

To draw a parabola to a scale of 1 in. to the foot, with the greatest height 4½ in. at 18 in. back, give AF a value of 3/10 in. This can be drawn on cardboard and then cut out with scissors and used thereafter in making drawings by working around.



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The R. O. Rubel, Jr., & Co., aero supply concern, has offered twelve trophies, under various conditions, as follows:

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Sworn affidavits together with two witness' signatures required in filing report.

No other conditions are imposed except that the engine be purchased through the company.

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HELICOPTER PATENT FOR SALE.

W. E. Colyer, Box 391, Saranac Lake, N. Y., has a patent to dispose of, No. 897,738, Sept. 1, 1908. The machine covered therein is of the helicopter type, comprising two superposed screws or discs on concentric upright shafts driven by bevel gears, and rotating in opposite directions. There is a framework upon which is mounted the engine, driver's seat, etc., with means for shifting the center of gravity by a lever in order to tilt the lifting screws and give the whole apparatus a forward movement. Steering right and left is effected by a vertical rudder at the rear of the frame.

There are two claims in the patent, as follows:

1. A flying machine comprising a main frame, oppositely rotating propellers carried thereby, a supplemental frame suspended from the main frame, said supplemental frame comprising hangers pivotally connected with the main frame, a bottom bar pivotally connected with the hangers, and a link joining the hangers above the bottom bar, drive gearing supported by the main and supplemental frames for driving the propellers, and adjusting means connected with the bottom bar and link of the supplemental frame for shifting the portions of said frame to change the center of gravity of the machine.

2. A flying machine embodying a main frame, propellers carried thereby, a supplemental frame suspended from the main frame, said supplemental frame comprising hangers pivotally connected with the main frame, a bottom bar pivotally connected with the hangers, and a link joining the hangers above the bottom bar, drive gearing supported by the main and supplemental frames for operating the propellers, and adjusting means associated with two of the aforesaid portions of the supplemental frame for shifting said frame to change the center of gravity of the machine.

A NEW PRINCIPLE FOR AUTOMATIC STABILITY.

To the Editor.—Stability under all conditions is a necessity to a successful aeroplane, and an automatic form of maintaining the equilibrium has an incalculable advantage over one that requires the constant attention of a skilled operator. A pendulum arrangement of the weight is cumbersome and awkward, as is also the gyroscope, and a complex superstructure is always at a great disadvantage. Neither do I believe that any permanently rigid type of supporting surface, even such as Bell's tetrahedronal cell system, can successfully meet all conditions.

I set out to find some arrangement of the supporting surfaces simple in construction that would equalize the pressure throughout the machine in all atmospheric disturbances. I wanted something such that as one side of the machine would be tilted up under sudden uneven pressure, the pressure would be equalized and equilibrium restored. I wanted the angle of incidence to alter itself to meet changing conditions, and I finally worked out the following method:

Planes are hinged to each side of a central frame or chassis so that the lines of connection (B B in figures) will diverge sharply to the rear, giving the vertical projection of the central frame the form of a triangle with base to the front. At points near the extremities of the opposing planes a cable is fastened which runs through a pulley (A in Fig. 2) located below the level of the planes.

Now you will note that swinging one of these planes down will increase its angle of incidence, and, as the two sides are joined by the cable, a movement on either side causes an opposing movement on the opposite side. As the cable runs freely on the pulley, extra pressure exerted on one side as by a gust of wind will force that side up, but while doing so would decrease its angle of incidence (to the possible extent of forming a negative angle), lessening the pressure due to the advance of the machine, and not only would that alone tend to preserve equilibrium, but the cable would exert a downward pull on the opposite plane, tending to increase its angle of incidence, consequently equalizing the pressure.

An additional effect may be secured if we raise the pulley; then both planes will be raised and their angle of incidence would be decreased, while lowering the pulley would have the opposite effect, thus transferring to the main supporting planes the function of extra elevator planes.

Still further is it to be noticed that if the pulley be held in place by a properly adjusted spring so that changes in pressure due to the relative speed of the machine would raise or lower the pulley changing the angle of incidence to meet the changes.

Bracing and trussing would have to depart from present methods, as the entire strain is concentrated on the cable and hinge connection, but after considerable experiment I believe that a machine of this type may be built lighter, simpler and safer than a so-called rigid type. At least that has been my experience with gliders. The principle may be applied to either monoplanes or biplanes, though several inherent features of the biplane seem to favor its use with that type. Financial circumstances have prevented me from experimenting in reference to the elimination of the rear auxiliary planes, except in the case of gliders, but I think it can be done with advantage in a power driven machine.

Note.—The principle is protected by patent right in this country.

M. B. DUNKLE.

Moscow, Idaho.

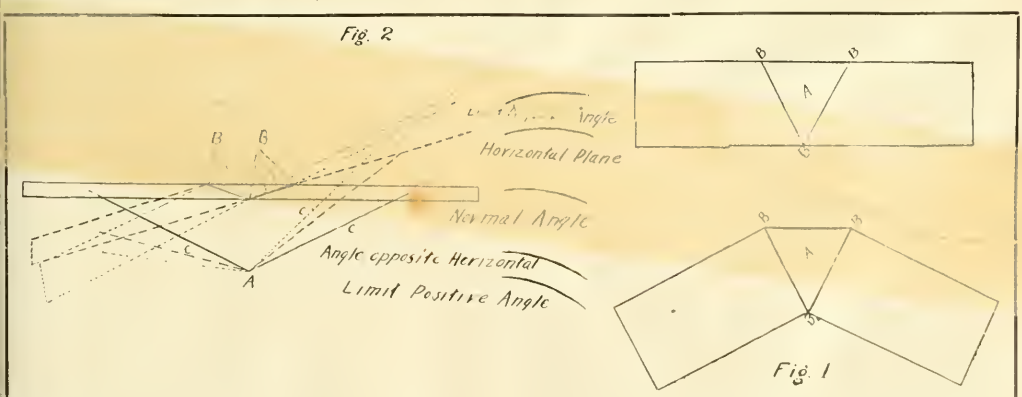

Figure I.
Showing two methods of joining planes to central frame. work.
A. Central frame.
B. Hinged connection of planes to chassis.

Figure II.
Showing action of planes in maintaining lateral stability.
A. Pulley.
B. Hinged connection of planes.
C. Cable or connecting element.

CORRECTION.

To the Editor.—I beg to call your attention to the error in the specifications of drawings on pages 105-106 of September AERONAUTICS. On page 105, paragraph 4, lines 19, 20 and 21 ("The longitudinal action front and rear is simultaneous. There is no transverse action of rear rudders except for emergencies. The advantages") should be in paragraph 1, page 106, lines number 5, 6 and 7.

In paragraph 5, page 105, line 9, you have "(Fig. II) B. E. are adjustable," etc., which should be (Fig. II B), etc.

Any one who is interested enough to make this correction will get a great deal more sense out of the three paragraphs. A number have evidently figured this out for themselves, as I have received several inquiries and will probably receive more.—Very truly yours,

J. W. FUHRMANN.

Chicago, Ill.

Ladis Lewkowiez, who will be remembered in connection with the importation of a Bleriot machine into this country, has been able to make a flight of 40 miles in length in Holland.

James Montgomery's play, "The Aviator," was presented by Cohan & Harris in Boston, opening September 5. There were two boxes full of aviators, including Grahame-White, Brookins, Ralph Johnstone, and others. The comedy is cleverly written and very funny.

The "Bleriot XI," which was built by the Church Aeroplane Company, made a big "hit" with the audience, as they were surprised to see a real live machine, which takes five men to hold when the engine is started up.

The Aeronautical Society of Great Britain is going to present Octave Chanute with its gold medal. The ceremony has been delayed by his recent severe illness, but he is expected to be over in England in the autumn. The medal will probably be presented at a public dinner.

The list of aviation pilots of the Aero Club of France now totals 207.

CLASSIFIED ADVERTISEMENTS

FOR SALE—7 h. p. Curtiss motor, good as new. $100; first offer takes it. Max Stupar, 9626 Erie Avenue, So. Chicago, Ill.

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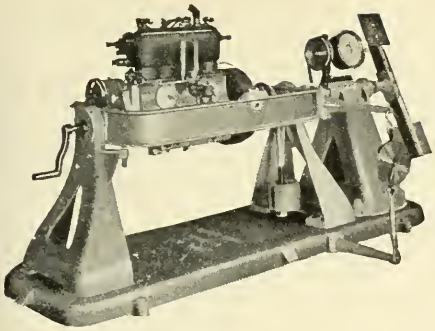

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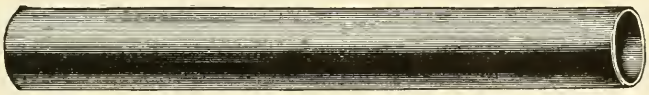

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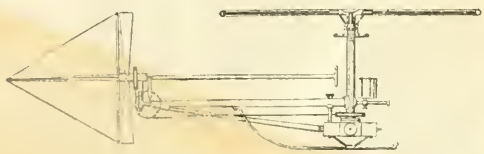

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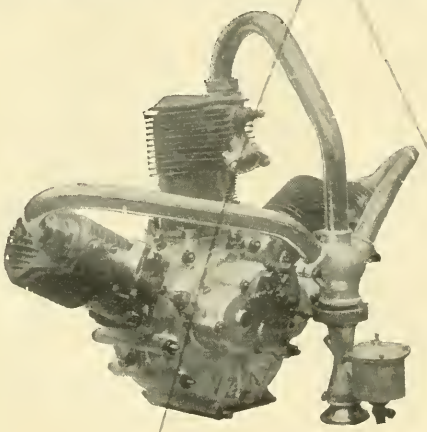

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NOTES FROM ABROAD

PASSENGER SLOW AND FAST SPEED RECORD.

Bouy, France, Aug. 16.—Lieut. Mailfert, with passenger, in a Farman machine, flew 12 kil. in minutes, an average of 17.69 m. p. h. Rerning, the distance was covered in 8 minutes, speed of 55.8 m. p. h., the difference being e to the wind.

GERMAN CROSS-COUNTRY RACE.

Frankfort, Germany, Aug. 17.—Five machines started in a cross-country race from Frankfort to Mannheim, for $10,000 in prizes. Thelen (Wright) with a passenger, had to land at Mains on account of cracked cylinder. Weinezlers (Antoinette) and Jeannin (Farman) also reached Mains. Two days later the balance of the trip was made. Jeannin shipped his machine back and made the flight in one stage in 1¾ hours. Lochner and Lindpainter also covered the course.

FLIGHT CROSS-COUNTRY IN AUSTRIA.

Vienna, Austria, Aug. 18.—Adolf Warchalowski flew in his own type machine from Wiener-Neustadt to Vienna and back, covering 110 kil. in 1 hour and 30 minutes.

THIRTEENTH VICTIM OF POWER MACHINE.

Rome, Italy, Aug. 20.—Lieutenant Pasqua Vivaldi of the Italian army was killed this morning by a fall from his Farman aeroplane. He had made a trip in the early morning from the military aviation field at Centocelle to Civita Vecchia on the Mediterranean sea, thirty-eight miles from Rome, and was returning to Rome when the accident happened. A few miles outside of Rome the machine dashed to earth, for some unexplained reason. At the time of the accident the aeroplane was 300 ft. high.

ANOTHER DEATH.

Flushing, Holland, Aug. 27.—Clement Van Maasdyck, flying at a height of 150 ft. when machine stopped and fell perpendicular to the ground; the aviator fell on his back, the full weight of the engine on his breast, and was instantly killed.

FLIES ACROSS LAKE GENEVA.

Geneva, Aug. 28.—Armand Dufaux today won the Swiss aviation club's prize for a flight across Lake Geneva in an aeroplane. Starting at Noville, four miles south of Montreux, he flew to Cologne, near Geneva.

The distance, about forty miles, was negotiated by M. Defaux in fifty-six minutes.

FIVE PERSONS ON A BIPLANE.

Lille, France, Aug. 29.—Louis Breguet, the aviator, took up four passengers in his biplane besides himself. The total weight sustained by his machine, including the gasoline, was 921 pounds. This feat is believed to be a world's record.

Paris, Aug. 29.—M. Bielovucci made a sensational aeroplane flight above Paris today, and circled above the Eiffel Tower at a height of 2,450 feet.

NEW WORLD HEIGHT RECORD.

Havre, France, Aug. 29.—Leon Morane, in his Bleriot, broke the world's altitude record, reaching a height of 7,054 ft.

Ostend, Belgium, Sept. 2.—Miss Helene Dutrieu, the French aviator, established a new record for woman pilots in distance and altitude with a passenger today. With a companion in her Farman areoplane Miss Dutrieu flew from this city to Bruges and returned, without alighting, a distance of about 28 miles. At Bruges she circled above the famous belfry of Les Halles, at a height of 1,300 feet.

ANOTHER FAST PASSENGER FLIGHT.

Douai, France, Sept. 2.—A military aeroplane piloted by Louis Breguet and carrying also Capt. Madiot, who made observations, flew from here to Arras and return today at a rate of 55¾ miles an hour, establishing a new record for speed with a passenger.

WORLD HIGH RECORD AGAIN BROKEN.

Beauville, France, Sept. 3.—Leon Morane broke the world's altitude record again today. He smashed his own previous figure for altitude and made a new mark of 8,468 ft. His propeller stopped at 4,500 ft. and the glide to earth was made without power.

FLIES FROM PARIS TO BORDEAUX.

Bordeaux, France, Sept. 3. M. Bielovucci arrived at 12:25 p. m. today from Angouleme, completing the final stage of his flight from Paris to Bordeaux. He made the trip with only three intermediate stops. Bielovucci's time from Paris to Bordeaux was 6 hours 14 minutes of actual flying and the route covered is estimated at 335 miles.

The first stage was to Orleans, 110 kil., on Sept. 1. The following morning he flew 170 kil. to Chatellerault in 1 hour and 45 minutes. After lunch he reascended and continued to Angouleme, 135 kil. The next morning he completed the trip. The speed for the 170 kil. stage figures 97 m. p. h. average. His machine is a Voisin.

MOISSANT FINALLY REACHES LONDON.

London, Sept. 6.—John B. Moissant, the American aviator who started from Paris on August 16 for a flight to London in his Bleriot, and who after crossing the English Channel with his mechanician as a passenger, met with several mishaps, finally reached the Crystal Palace at 5:30 o'clock this afternoon. After circling the palace he flew off in the direction of Beckenham without alighting.

Moissant, with his mechanician, Albert Fileux, as a passenger, left Paris Aug. 16, and reached Amiens without mishap the same evening. The next day he left Amiens and crossed the Channel with a passenger, thereby making a new record. He was compelled to descend at Tilmanstone, about seventy miles from London, because of high winds. He resumed his journey to London the next day, but was compelled to land at Upchurch, about thirty-five miles from London, on account of the wrecking of his propeller and damage to his planes.

He started again on August 20, but met with another accident after going about five miles and landing at a place between Gillingham and Twydale. He made other attempts to reach London since that time, but was compelled to descend after making very little progress.

Moissant started again this morning, but had to come down at Oxford, some twenty-five miles from London. He made slight repairs here and then started on the flight which brought him to his goal early this evening.

NEW RECORD FOR HEIGHT.

Issy, Sept. 8.—George Chavez, a young Peruvian aviator, broke the world's record for height, rising in a 50 h. p. Bleriot monoplane 8,792 ft. in a flight taking 41 minutes.

DESTRUCTION OF ZEPPELIN VI.

Baden Baden, Germany, Sept. 14.—The Zeppelin VI., took fire after an explosion, while being warped into her shed.

The Zeppelin VI. during the past eighteen days has made thirty-four passenger trips, covering about 2,000 miles, and carrying more than 300 passengers. The flights of the dirigible were made regularly, often in unfavorable weather. The airship ascended at 11:20 o'clock today with twelve passengers for a trip to Heilbronn. It had covered about twenty miles, when a motor in the forward gondola acted badly. It was impossible to effect satisfactory repairs, and after some time had been spent in the futile effort, the airship returned here.

The Zeppelin VI. will be best remembered by its notable flight from Friedrichshafen to Berlin, when it carried Count Zeppelin, the inventor, on a visit to Emperor William. The airship was built in 1909, but had since been altered and enlarged. Suspended from the center was a luxuriously furnished cabin. She carried a crew of ten men.

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American Sportsmanship.

FOR the sake of American sportsmanship, it must be urged that, in defending trophies gained by Americans, apparatus of home manufacture be employed.

It is with sincere regret that one remembers it seemed desirable by some of our representatives to use foreign made balloons in the four past Gordon Bennett balloon races.

The 1906 Gordon Bennett was won for America in a foreign made balloon, the only entry. In 1907, at St. Louis, but one of our three balloons was of American make. At Berlin, in 1908, two of the three American balloons were made in Europe. In 1909 we had but one representative, Mix, who is looked upon in France as a Frenchman, and he used a French built aerostat.

It should be made a rule that defenders of American sports use apparatus of home make. Is it not a hollow victory to win from France an American cup in a French balloon?

Will the plaudits of the American people be very hearty if American sportsmen see fit to use a foreign balloon or a foreign aeroplane in the two international events to be held here this Fall?

IT is sincerely hoped that our representatives in the aviation race will be picked after elimination trials. When, in 1907, AERONAUTICS urged elimination trials for the 1908 Gordon Bennett balloon race one of the officials of the Aero Club of America raised holy protest at the bare suggestion of such a socialistic scheme. The idea! With satisfaction AERONAUTICS views the elimination race at Indianapolis.

Dr. H. W. Walden, a plucky would-be aviator, who recently had a rather narrow escape from serious injury in his first attempt at flight with a new monoplane, tells of an amusing incident relative to the accident.

After having his broken collarbone and three ribs bandaged by the local hospital surgeons, he proceeded to the railway station to take the train for New York. While waiting on the platform he noticed a man walking nervously up and down and finally the object of his concern addressed him.

"Are you not Dr. Walden?" said he.

"Yes."

"Well, I thought you were dead! I'm the undertaker of the town."

Personal.

D. E. Linquent, Esq.

Dear Sir:—There evidently is a well-founded impression among the aeronautically inclined in this country that I am publishing AERONAUTICS for the benefit of my health; or else they imagine the magazine is some wonderfully productive gold mine.

I freely admit that the financial health of the paper has improved considerably within the past year, and it might be now considered convalescent. I don't like to think of the possibility of a relapse.

Other publications of an aeronautical nature have come and gone or have leanings in the latter direction. They never "come back"—to stay. But AERONAUTICS has always managed to pull through any sinking spells, thanks to the hearty support of its ever-increasing readers, who have appreciated what I have been trying to accomplish.

Now, please don't think that your continued support is not desired—for it is.

UNDRESSED FACTS.

There is quite a number of unpaid renewals on the records. The delinquents have had several requests to come across, but they have NOT responded, either one way or the other—not even when there was inclosed an addressed postal with the official portrait of Uncle Sam in the corner.

If I can't get attention for my letters, there is only one thing left to do—and I have done it herewith. If anything is read through, it's AERONAUTICS. I know you want the magazine for you began when it wasn't quite so good as it is now. I know many of you personally, and I am certain you do not mean to let your subscription cancel by default.

"DO IT NOW."

Very truly yours,

E. L. Jones

National Balloon Race Results.

New York, Sept. 22—Unofficial figures were given out today of the standing of the contestants in the National Championship Race and elimination race for the Gordon Bennett from Indianapolis. These are subject to revision by Mr. Williams Welch of the U. S. Signal Office.

A. R. Hawley, to Warrenton, Va., 460 m.
H. E. Honeywell, to Brush Valley, Pa., 385 m.
S. L. Von Phul, to Trafford, Pa., 380 m.
J. H. Wade, Jr., to Showalter, Va., 375 m.
W. T. Assmann, to McFarland, W. Va., 320 m.
Chas. Walsh, to W. Milton, O., 295 m.
A. T. Atherholt, to Dexter, O., 235 m.
C. B. Harmon, to Powellsville, O., 180 m.
C. G. Fisher, no record.

Hawley, Honeywell and Von Phul will represent America in the Gordon Bennett from St. Louis, Oct. 17. No records were broken.

Notice.

It is found necessary to state that A. C. GRANT has no connection with AERONAUTICS. We will not be responsible for any agreements made by him in our name. He has no authority to use the name of the magazine in any way whatever.

AERONAUTICS PRESS, INC.

THRILLING NIGHT BALLOON TRIP

By Dr. Thomas E. Eldridge.

THE voyage from Philadelphia to Danbury, N. H., Aug. 3 and 4, was a brilliant success, and surpassed any other flight I have ever undertaken. The peculiar feature of this trip was that it was made chiefly in total darkness, a rare experience, that has peculiar charms such as are impossible to describe. Mr. Welsh Strawbridge and myself ascended from Point Breeze at 9:28 on Wednesday night, rising immediately to an altitude of about 1,000 ft., at which height we passed in a north-northeasterly direction over the city. As we left the city, we passed into total darkness—darkness so deep that we could not determine what were the particular points over which we were passing. Indeed, so far as locality was concerned, it was possible only to distinguish the general character of the country.

At 12:35 we passed over a number of mountains, which we realized through our drag rope catching. At 1:10 a. m. we passed over another river, and at that point we found ourselves buried in the deepest and most oppressive darkness.

SAILING OVER THE MOUNTAINS.

All through the night we passed over mountains, lakes, towns and rivers

All this time we were enveloped in such darkness as is impossible for me to describe. I can only say that as we were passing through it, I thought of the first chapter of the Book of Genesis, of the chaos that existed before the world began and of the terrible immensity of space. It was a darkness overwhelming, and both Mr. Strawbridge and I were glad when we saw the first signs of daybreak. That was about 4:10 a. m. Over the great chains of mountains we could see the inky blackness gradually fading into gray.

SAW WONDERFUL SUNRISE.

And such a color effect as we saw in the transition of the black through the various shades of gray is something that cannot be described; to be appreciated it must be seen. And when the daylight disclosed to us the world below, we agreed that never before had we seen such wild, rugged scenery as that lying at our feet. Finally we saw the sun, a great globe of red fire, climbing over the mountains and shedding his light upon a beautifully cultivated region over which the balloon was passing. At 5:10 we went over another river, and then we beheld all the beauties of sunrise, all the gorgeous tints and shades of red and yellow and blue.

All during the trip we had not suffered from cold, but about 7 o'clock Thursday morning we were obliged to put on a little extra clothing. At that time we passed through a hailstorm, the particles of which were about the size of sago kernels. That was at an altitude of 13,750 ft. About 8 o'clock we rose to a height of 15,100 ft., about which time, we afterward learned, we had passed over the Rugged Mountains and the Kearsarge Mountains, the highest points in New Hampshire. At that time, too, there was a thunder storm going on beneath us, and we could see the lightning flash and hear the thunder. After that we saw wonderful cloud effects.

All around us as far as we could see were immense towers of clouds, thousands of feet high, forming a gigantic basin, in the middle of which floated the balloon. These clouds gradually approached us from every side until we were entirely enveloped in them. So dense, indeed, were they that we could not see the balloon's bag above us. At the same time the clouds caused the gas in the balloon to condense and we then knew that it was time for us to descend.

From an altitude of 15,100 ft. we dropped into the midst of woods two and a half miles north of Danbury, Merrimac county, N. H. As we descended the balloon was caught between four trees and we were obliged to climb down to the ground. Mr. Maxfield, the proprietor of the farm, greeted us, and at once, with his men, proceeded to chop down the trees so that the balloon might be disentangled.

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ASCENSIONS

NOTE: Asterisk (*) denotes trips of 100 miles or over.

*Point Breeze, Pa., Aug. 16.—Dr. Thos. Edwin Eldridge, pilot, Dr. George H. Simmerman and Ira L. Brown in the "Phila. II" to Negro Mt., Md., 222.37 miles. The party left at 8:27 p. m. and rose above the clouds in the moonlight. The log says: "A most wonderful effect. The dull, sombre shades of gray contrasted markedly from the light, airy effect by day. Passed over Hanover and Gettysburg at 2 a. m. At 3 a. m. crossed the Allegheny mountains. The sight was wild and picturesque at daybreak, when the sun lifted the balloon to 14,000 ft. The landing was at 9:05 a. m." Dr. Eldridge now holds the Philadelphia record for altitude, distance and duration.

Hamilton, O., Aug. 18.—Mr. and Mrs. George R. Howard, Mrs. Charles Troutman and Mr. and Mrs. Albert Holz in the "Drifter" to Dry Ridge, Ky. Distance 50 miles, duration 3½ hours, altitude 5,700 ft.

Pt. Breeze, Philadelphia, Aug. 25.—A. Leo Stevens, Arthur T. Atherholt and Conyers B. Graham in the "Penn. I" on a night trip, landing at South River, N. J., at 4:45 a. m., leaving at 3:25 a. m. Distance, 55 miles.

Lowell, Mass., Aug. 27.—J. Walter Flagg, pilot, John W. Harrington and Henry J. Murch, to Haverhill, Mass., a distance of about 17 miles. Duration 1 hour and 20 minutes.

Topeka Club Buys Honeywell Balloon.

St. Louis, Mo., Aug. 28.—H. E. Honewell piloted Messrs. Emerson, Cole and Sweet of the Aero Club of Topeka on a demonstration trip. After making three landings, the last being near Jerseyville, Ill., the party hurried back to St. Louis with the balloon. The Topeka men bought the balloon for the use of the members of the club. It has a capacity of 40,000 cu. ft. In addition to the four people, 16 bags of ballast were carried and besides that, two landings along the way were made. At the final descent, there were 10 bags still left.

Mr. Honeywell is using his balloon "Centennial" in the Indianapolis race, and other entrants have Honeywell-built balloons. A new dirigible balloon has been completed by him along original lines which will soon be given a try-out. The gas envelope is flat on the under side. There is a large rudder for controlling the lateral movement of the balloon attached to the stern, while on the bow there is fixed a larger plane for horizontal steering. The machine is provided with an aluminum propeller and has a capacity of 9,000 cubic feet of gas.

The French-American Balloon Company, of which Mr. Honeywell is director, has done a surprising business in the manufacture of balloons. The gas balloons have gained and hold many records.

Indianapolis, Ind., Sept. 3.—Capt. G. L. Bumbaugh, Ray Harroun and F. L. Galnaw to Millersville, Ind.

Pt. Breeze, Philadelphia, Sept. 3.—A. T. Atherholt, pilot, H. H. Knerr and Clarence P. Wynne in the "Penn. I," to Pipersville, Pa., a distance of 33 miles. The ascent was made in a driving rain. The balloon was allowed to go up to 9,000 feet without being able to get out of the clouds into clear sky. No land could be seen and even the statoscope failed to work and cigarette papers were used in its place.

Jackson, Mich., Sept. 3.—J. H. Wade, Jr., and A. Leo Stevens in the new Wade balloon "Buckeye."

Indianapolis Speedway, Sept. 5.—G. L. Bumbaugh, Dr. L. E. Custer and Dr. C. W. Mills in the "Indiana," had an exciting experience in an ascent at the close of the auto races. A storm came up just after getting up and the rain came down in sheets. Up and down the wind took the balloon and the aeronauts did not dare use the little ballast they took along. The drag rope caught electric light wires on descending and broke them. The final landing was in the treetops. The trip lasted about 25 minutes.

Hamilton, O., Sept. 6.—George R. Howard, George Mosner, Chas. Trautman and Edward Penrod in the "Drifter" to Newark, O.

CLUB NEWS

The **Aero Club of Pennsylvania** has had delivered a new 35,000-foot Stevens balloon, called the "Pennsylvania I." A "Balloon Section" has been formed, to the treasury of which a limited number of members pay $2.50 weekly for ten weeks. Each week lots are drawn and three members have the privilege of an ascent. See "Ascensions" for records.

A series of flight exhibitions will be held at the club aviation grounds at Clementon, N. J., the first being on September 24-25, when Charles F. Willard will make his second appearance before Philadelphians. It is possible that Graham-White and Harmon will fly the following week.

The Aeronautical Society, at an extraordinarily well attended meeting on September 8th, was favored with an interesting and valuable talk on autogenous welding, by Mr. A. Davis, of the Davis-Bournonville Co. A complete apparatus was used for demonstrating. Holes were cut in thick steel, steel tubes welded together and plates of steel cut quickly in two by the 2,300 degree flame of an oxy-acetelin blowpipe.

On August 25th was held a discussion on "New Devices," Wilbur R. Kimball described his new model. G. L. Lawrence told of his experiences in aeronautics, beginning with the hot-air balloon. With his experience as an actor to augment his effervescent humor, his tale was well worth hearing.

The **Aero Club of Long Island** has been incorporated with the Secretary of State to carry on experiments in aerodynamics and to advance the science and sport of aviation. The directors for the first year are: Howard C. Brown and Charles Wald, of Brooklyn; Francis C. Willson, of Flushing; Henry L. Newell, Jr., of Richmond Hill, and John H. Lisle, of Glen Cove.

Book Note.

Le no 12 de la *Technique aéronautique* (15 juin 1910) contient une étude expérimentale des *hélices propulsives* par M. le capitaine Dorand, du laboratoire des recherches relatives à l'aérostation militaire. Ce travail, d'un caractère définitif, aboutit à des conclusions pratiques d'une grande portée au point de vue de l'agencement des aéroplanes.

Dans le meme numéro, M. Riester-Picard, décrit un nouveau type d'aéroplane à *vitesse variable*. M. le capitaine Do, du bataillon des aérostiers militaires, établit la théorie du guiderope (suite et à suivre); M. Rabbeno émet des apercus théoriques et expérimentaux sur les hélices au point fixe . . ., etc.

Prochainement la suite des *papiers inédits du colonel Ch. Renard* (hélicoptère et hélico-aéroplane.)

L'Aéroplane Pour Tous, par MM. Lelasseux et Marque, Ingénieurs E. C. P., suivi de *Les Deux Ecoles D'Aviation*, par M. Paul Painlevé, de l'Institut.—Un volume illustré.—Prix : 2 francs.—*Librairie Aéronautique*, 32, *rue Madame, Paris.*

Voici le livre qui va permettre à chacun de se mettre en quelques instants au courant de la grande question de l'aéroplane, dont il n'est plus permis à personne d'ignorer les principes; en un style qui sait etre scientifique sans etre ni rebutant ni fastidieux, par des raisonnements mis à la portée de tous, sans l'emploi d'aucune formule mathématique, ce beau volume contient une théorie excessivement claire de l'aéroplane et de l'emploi de ses organes de direction et de propulsion. Observant un juste milieu entre l'ouvrage de vulgarisation par trop banal et le précis scientifique de l'ingénieur, cette étude renferme un tableau complet de l'aviation depuis son début jusqu'aux dernières prouesses de nos aviateurs. Elle permet à tout le monde de se faire une idée nette de la locomotion nouvelle et d'en causer sans commettre d'erreurs.

De nombreuses photographies, des dessins schématiques et des tableaux d'ensemble complètent cet ouvrage dont la valeur est affirmée par son tirage, qui atteint aujour-d'hui la 24th édition.

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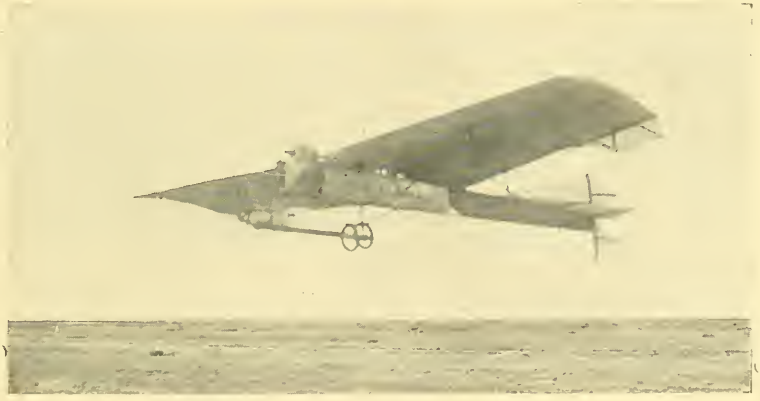

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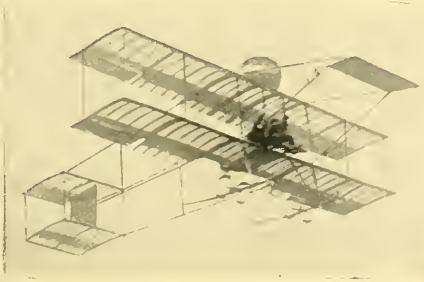

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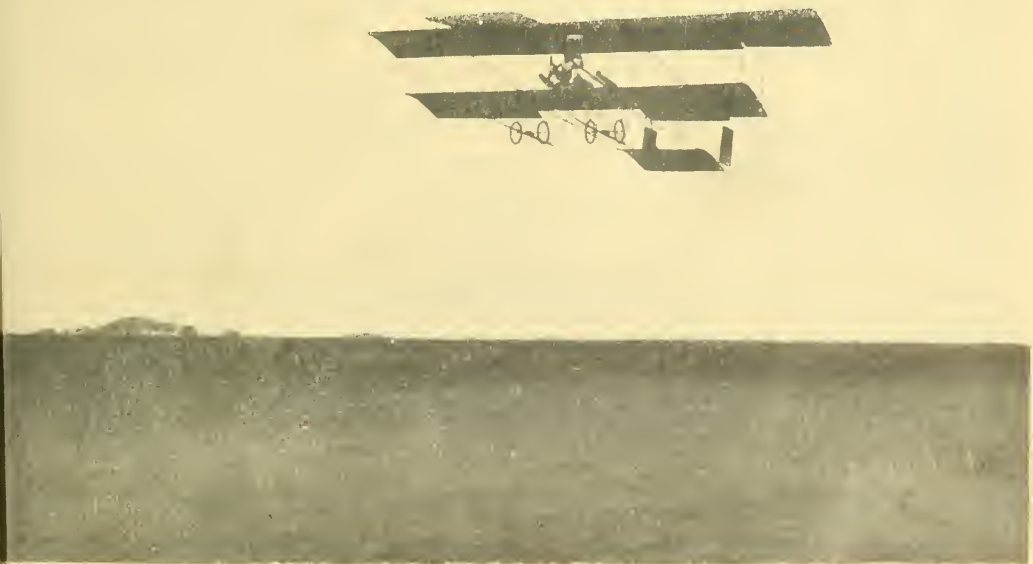

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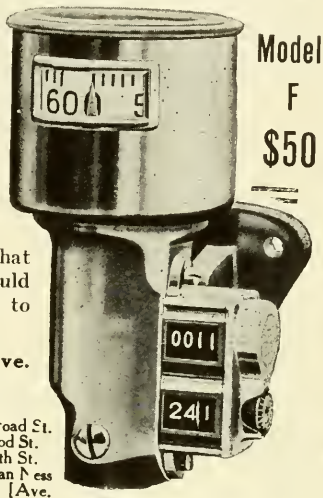

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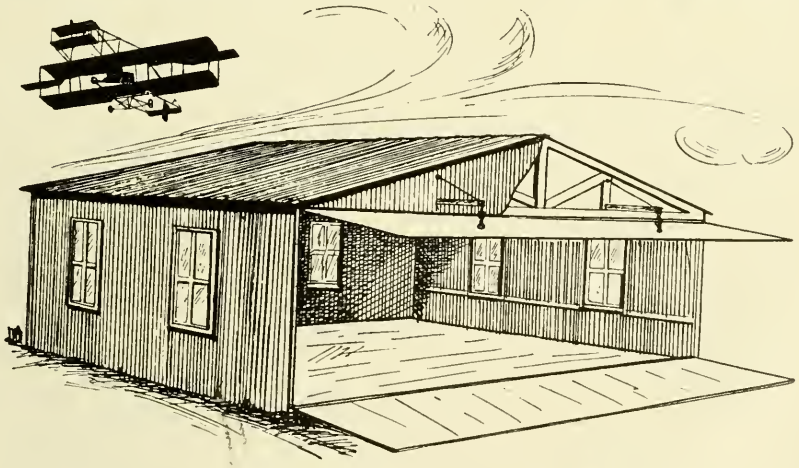

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Aeronautics

No. 5

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AERONAUTICS AND WAR

By Lieut.-Col. W. A. Glassford.

SIGNAL CORPS, U. S. ARMY.

PHILOSOPHICALLY, it would no doubt be interesting to trace the order of thought on the subject of man's flying hat obtained from remote antiquity down to he time of the invention of the hot air bal-oon in 1782, but it would not be of any use n a technical sense. The only advantage that night be derived from such an inquiry would e a better understanding of the feeling which ctuates the public mind on this subject to-ay. The general notions that prevailed down o the time of the discovery of the barometer nd of the air pump were not of a scientific rder, and their study would mainly lead to a ontemplation of the superstitions that have etarded the development not only of aero-autics but of man.

The Egyptians, 4,000 years ago, possessed ie necessary skill for making a hot air bal-oon with its equipments—cordage, basket and ll, and so doubtless did Chinamen, and many ther peoples who then inhabited the earth. : seems very certain, however, that it never ccurred to any of them to try their skill n this direction. The Egyptians believed that ien flew at times, but when they did they first irned into birds; they certainly never believed iat man would ever be able to rise in the ir, unaided by occult or supernatural power. nd this is true of all peoples down to the eventeenth century.

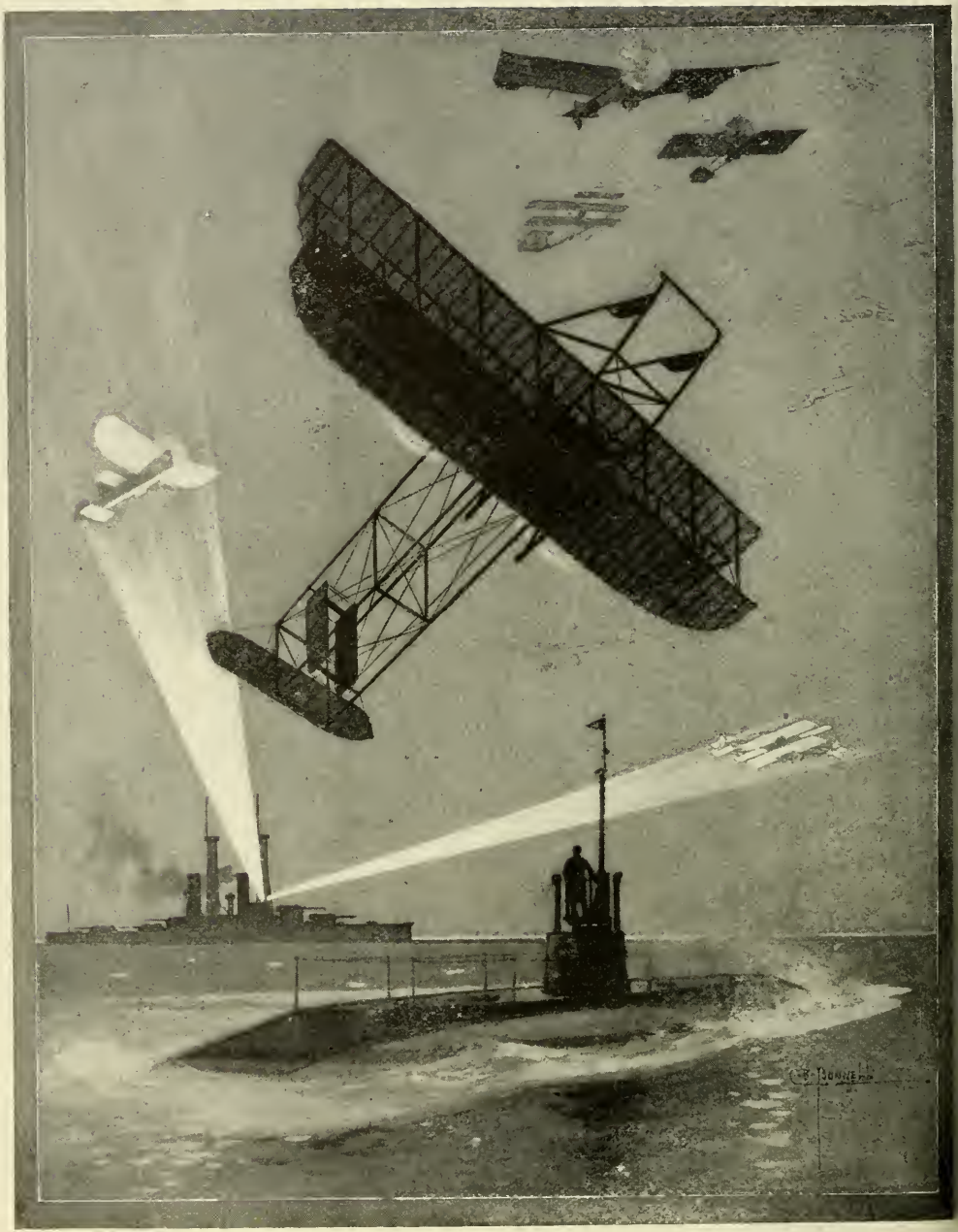
Man, down to a recent epoch, was not in the ossession of the necessary facts or natural rinciples to enable him to think on the sub-ect intelligently; furthermore, the kind of otions he cherished was frankly hostile to very thought that might lead to the discovery f principles useful in the development of aerial avigation. He peopled the air with gods, ngels, spirits, jinns, devils and witches and a ost of other imaginary beings, and gave to iem the absolute rule of it. The atmosphere :ing, in his imagination, the special realm of ie deities and of the evil spirits, might not be espassed upon.

Allusions to man's flying are not wanting in ie stories and legends of antiquity; but they 'e generally in some way connected with ystic or supernatural notions. Nowhere do e find the simple belief that a man unaided by ipernatural power would ever be able to rise the air. Among the legendary flying ma-ines none occupies a more conspicuous place an the flying horse. Originating in India, its rformances are recorded in the stories of Egypt and of Greece, of Persia and of Arabia; its career ending in the memorable ride of Don Quixote. We have, also, accounts of flying chairs and of flying carpets, and of other things, all capable of carrying passengers, when moved by magic power or by enchantment. During the middle ages many men, also, were supposed to have acquired the art of flying through their knowledge of magic and necro mancy.

Such were the ideas that prevailed on the subject of aerial navigation down to the discovery of the barometer in 1645. The few suggestions that are met with previous to this epoch, which do not fall into the category above mentioned, are so devoid of detail in their description as to make their consideration useless. Speculation concerning aeronautics gave rise to no tangible ideas on the subject down to the discoveries which led to the construction of the barometer and of the air pump, and the further discoveries which followed experiments with these instruments. The discovery of the barometer marks the dawn of knowledge that led to the development of aeronautics. Aeronautics has sprung from a purely scientific order of thought, and its development has depended in all its stages upon the progress of science and the consequent development of the modern industries.

The barometer brought to light properties of the atmosphere that are of prime importance in aeronautics, but they were of a nature so contrary to the then accepted notions that they gave rise to endless discussions as to the truth of the new discoveries. Nevertheless from this time on we meet with suggestions in which some of the true elements of the problem are taken into consideration. A knowledge of the facts that the atmosphere has weight and that its density diminishes as the altitude increases and that it is possible to produce a vacuum, could not fail in time to influence speculation on aerial navigation.

In a comical history of a voyage to the moon, which appeared about this time, mention is made of smoke as furnishing the lifting power used in a flying machine. In 1670 we meet with a proposition to utilize a vacuum contained in large, thin, globular copper vessels, with a sufficient description of the apparatus to show that the author was totally ignorant of the pressure of the atmosphere and of course unaware of the fact that his vessels could not possibly contain a vacuum, and be light enough to rise in the air.



Nearly a century later, in 1755, we meet with a proposition to collect fine diffuse air above the highest mountains and to inclose it in a bag of enormous dimensions, bigger than the city of Avignon, and composed of the strongest sail cloth, with which apparatus the author thought a whole army with its munitions of war might be transported at one time through the air. These suggestions, however absurd, in part, yet show the influence of a better understanding of the true nature of the atmosphere as revealed by the then recent discoveries.

The discovery of hydrogen in 1765 brought into the problem of aerial navigation its most important factor, a gas fourteen times lighter than air. Nothing now was lacking in order to produce the balloon but to inclose this gas in a suitable vessel. The industries of the epoch furnished all the necessary materials for

[*Continued on page 184*]

AERONAUTICS IN THE ARGENTINE

By Henry Helm Clayton.

THE Argentine Aero Club, like most aero clubs, began with ballooning. The club was founded the 13th of January, 1908, under the presidency of Engineer George Newbery, who made his first ascension in a free balloon on the 25th of December of the preceding year, accompanying Senor Anchorena in the balloon "Pampero" of 1,200 cubic metres capacity. The balloon rose from the ground of the Sociedad Sportiva in Palerino, and after crossing the La Plata river, impelled by a pampero wind, descended in the department of Conchillas, Uruguay.

The "Pampero" made nine ascents, during which there qualified as pilots Engineer Newbery, Dr. Edward Newbery and Major Waldino Correa. In a night ascent made by Dr. Edward Newbery, accompanied by Sargeant Edward Romero, this balloon was lost, and nothing has since been heard of the pilot, his companion or the balloon. This occurred on the night of Oct. 17, 1908.

Owing to this misfortune, the members of the Aero Club dispersed, and for some time aerostation was put aside, since all were impressed by this loss of a gentleman widely known socially and of a useful soldier. Nevertheless, one day Engineer Horacio Anasagasti, one of the directors of the Argentine Aero Club, bought the balloon "El Patriota," and made an ascension on the 24th of January, 1909, accompanied by Engineer George Newbery as pilot.

Following other successful ascensions, the president of the Club undertook to reorganize the association, and his patient efforts were rewarded with complete success, since the reorganized club has a full membership amounting to 200 members.

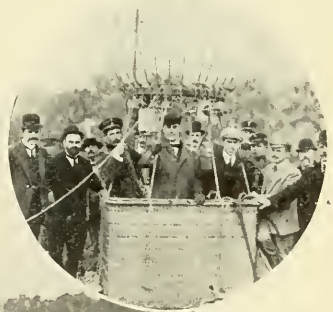
Slowly but steadily the Club grew stronger, possessing at present a park for aerostation, a club house, and four balloons, with all accessories. The club house contains a room for the secretary, a kitchen, living rooms for the attendants, toilets, and an ample aerodrome, where concourses of aviation are held periodically.

The balloons "Edward Newbery," "Buenos Aires," "Patriota," and Huracan," of 2,200, 1,600, 1,200 and 800 cubic meters, respectively, are in use every Sunday and holiday, when the weather conditions are favorable, for pleasure ascensions and for distance or point-to-point racing, etc.

Among the ascensions notable for the distance run, the hour at which it was made, and the fact that it has crossed foreign countries, may be mentioned that completed by the president of the Club, Engineer George Newbery, who in the balloon "Huracan" began a voyage at 11 p. m. on December 25, 1909, from the grounds of the gas company, Rio de la Plata, situated in Belgrand, and impelled by a strong pampero wind, crossed the river La Plata into the Republic of Uruguay, crossed centrally over the entire length of that country and descended in Bagi, in the state of Rio Grande do Sud, Brazil, having run a straight line distance of 550 kilometers in 13 hours.

An aviation meeting was held in April, 1910, under the auspices of the Club. At this meet there were entered several of the well-known French machines, as the Bleriot and Farman, and the meeting proved a great sucess. The president of the Club made the necessary flights to secure a pilot's license. Other members of the Club have in contemplation taking out a pilot's license, and it is possible that in a short time this will become a very important part of the Club's activity. But at present ballooning continues to be the most important sport, and in the point-to-point racing, which occurs very frequently, the four balloons belonging to the Club are usually seen in the air at once.

For the convenience of the members of the Club, most of whom live in Buenos Aires, the balloon park is in the suburbs of the city only a



Left to Right
Major WALDINO CORREA
Sr. H. ANASAGASTI
Dr. EDW. NEWBERY

Pres. Geo. Newbery

few miles from the harbor in the mouth of the La Plata. A short distance to the eastward lies the ocean. Fortunately the prevailing winds are from the northeast and the members of the Club have found by experience that they can float inland on this surface wind and then rise into a contrary or eastward moving current and return almost to their landing point. These two opposing currents are made much use of in the point-to-point races. In a recent contest of this kind some of the pilots went far out to sea in the upper current, and then sinking into the lower, returned to the land. But feats of this kind, and the nearness of the sea for other reasons, always subjects the pilots to more or less danger, and one of them has fallen into the sea so many times that he is called the "aquatic" pilot.

The Aero Club has rooms in the building with the Automobile Club, where they hold business and social meetings, and entertain their friends. This building is a fine house with ample rooms for entertainments; a good library, including a library of aeronautics and a splendid cuisine. Many of the members of the Aero Club are enthusiastic automobilists, and are now greatly interested in the art of aviation.

Owing to the fact that he was a member of the Aero Club of New England and a pilot in the Aero Club of America, the writer was made an honorary member of the Argentine Aero Club, and was royally entertained by the president, Engineer Newbery, and had the pleasure of meeting most of the prominent members, including St. H. Anasagasti and G. G. Davis, chief of the Argentine Weather Service. The members of the Aero Club make much use of the reports of the weather service in planning their voyages, and frequently carry instruments with them belonging to the service for obtaining records in the upper air. The observations made by the pilots in regard to the directions of the air currents at different heights are adding much to the knowledge of the air movements in the Southern Hemisphere.

AEROPLANES FLYING IN MEXICO

By E. L. Ramsey.

The new airship now being constructed in San Antonio for the Marquis de Casanova of Mexico City, met with an accident in the building shed, according to a letter received by the Marquis, and its completion will probably be delayed for three or four weeks, as it will be necessary to send to France for duplicates of the parts injured in the mishap.

The Marquis expects to go to the Texas city to bring back the new flyer sometime within the next month, and immediately thereafter will make flights about the city.

Among the many new devices attached to the machine will be a rudder of novel design partly built from the plans of the Marquis, who has had considerable experience with aerial craft in France. The entire control of rudder, planes and engine will be from the steering wheel. The engine being situated immediately back of the driver's seat, and all parts within easy reach of the aviator.

Miguel Lebrija, the aeronaut who made an ascension last Sunday morning, descended about 6 o'clock that same evening at a place about three kilometers from Cuatitlan on the line of the National Railway of Mexico, having covered during the six and a half hours he was in the air a little over fifty kilometers.

Lebrija said that he obtained a height of about 1,000 meters above the height of the Valley of Mexico, which would make his height above sea level about 10,500 feet. He is enthusiastic over the trip and claims that with his larger balloon he will establish a record for twenty-four hours.

Captain Nicholas Martinez of the Mexican Army, and who is one of the attendants of General Bernardo Reyes, who at present is making a tour of France, made a very successful flight in an aeroplane, accompanied by a captain of the Spanish Army, Sr. Samaniego, and by the Spanish aviator, Laygori.

WHO WILL WIN THE GORDON BENNETT?

The newspaper man ran across a pessimist the other day who seemed in great distress. The P. unburdened himself to the N. M. in this fashion:

"Do you realize," said he, "that the prospect for American supremacy in the Gordon Bennett aviation race, at least, is apparently very poor? Now, in other events during the Belmont Park meet we have a chance for duration and height records with machines already making flights. There is no question that a Wright machine will stay in the air as long and go as high as any other machine which may be brought into competition. It might be said, without any suggestion of a 'knock' that none of the Curtiss aviators have shown thus far form enough to warrant beating on duration and height performances, comparable with existing records. And none of the Wright machines at present known to the public can vie with the latest foreign speed record, although the Wright company is reported as building a special fast machine. Curtiss' fastest speed yet made with his machine figures 52.58 m. p. h., at the Boston meet."

"How about the amateurs"? asked the N. M.

"Clifford B. Harmon seems to be the only amateur in this country who has done much flying, and that has been done with a foreign machine. He certainly stands no chance in a speed contest, such as the Gordon Bennett is. His two-hour flight entitles him to consideration in duration flights."

"How about Hamilton?"

"I'll admit," said the pessimistic one, "that there you have something. Hamilton may find his 110 h. p. Christie motor of sufficient power to bring him into the lists as a possibility."

"It is now quite certain that Curtiss is building a special machine and motor capable of great speed," vouchsafed the N. M.

"Yes, but it is not at all certain that he will even fly it at Belmont Park. He has been invited to defend the cup with two others to be selected but has not yet given an answer to the club. The Aero Club of America, it is said on good authority, has offered to provide a 'retainer' fee, but it was not prepared to state the amount.

"If Curtiss should find his new machine to be faster than the record made by any other aviator in the meet, he may challenge the Belmont Park fastest flyer to a speed duel. Such a race, undoubtedly, would result in bringing a tremendous crowd to whatever spot Curtiss and his opponent might select for the scene of the conflict."

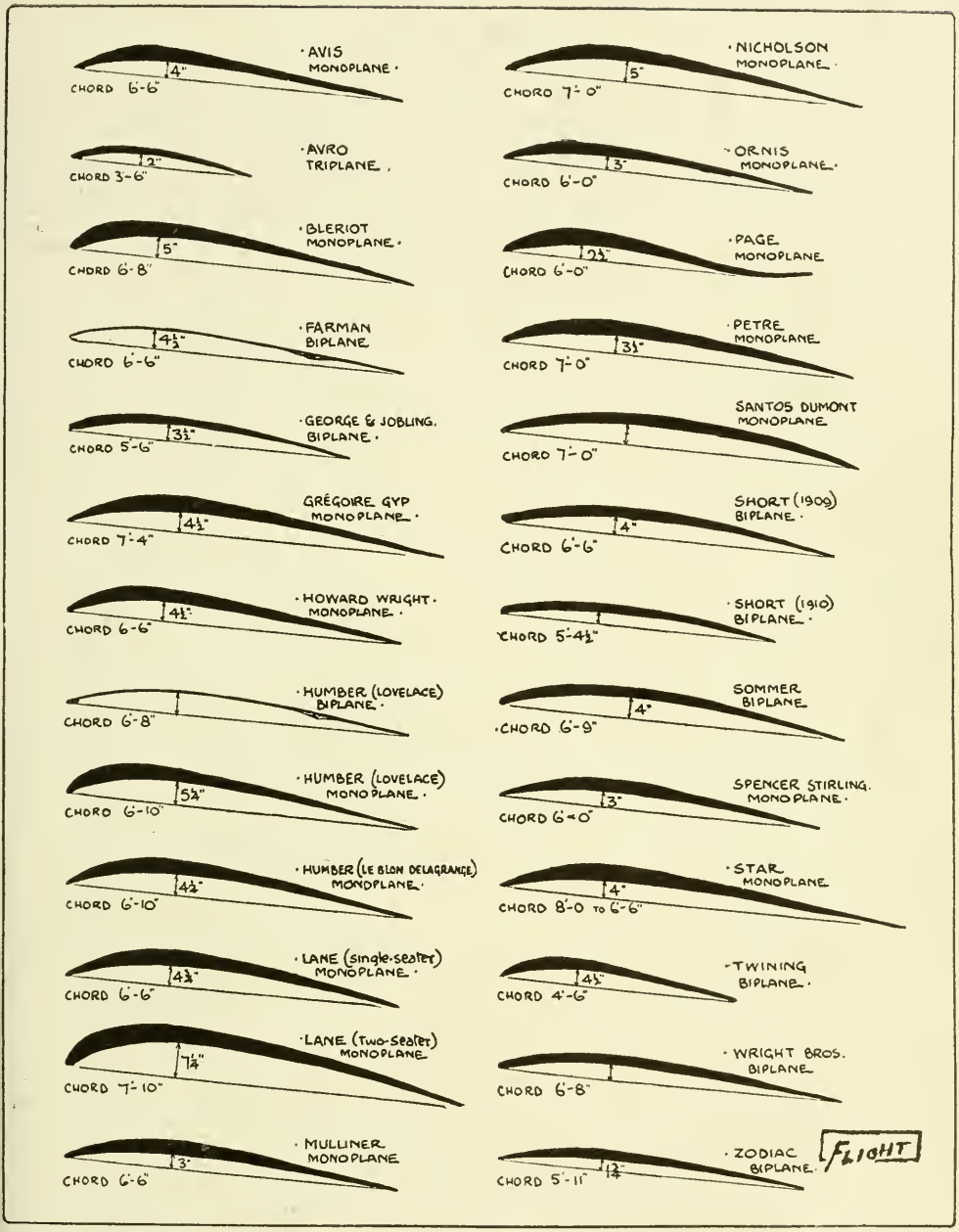
Here the P. O. brought out a table of figures he had been working on and offered them in evidence.

"The speed record of the world," he said, "is now 66.18 m. p. h., made in a Bleriot machine with a 100 h. p. Gnome engine, by Morane. The fastest American speed records are:

"52.58 m. p. h., Curtiss, Boston, 1910.

"47.43 m. p. h., O. Wright, Washington, 1909.

Here the N. M. excused himself and sought more congenial company.



Wing Sections

The above diagrams afford an interesting comparison of the wing sections of aeroplanes exhibited at the recent British Show. They are all drawn to a common scale, but have been set at an arbitrary angle of incidence, which does not necessarily represent that of the aeroplane in actual flight.—*Courtesy of our esteemed and valuable contemporary "FLIGHT," of London.*

NOTES ON FRAMING OF AEROPLANES

ADAPTED FROM AN ARTICLE

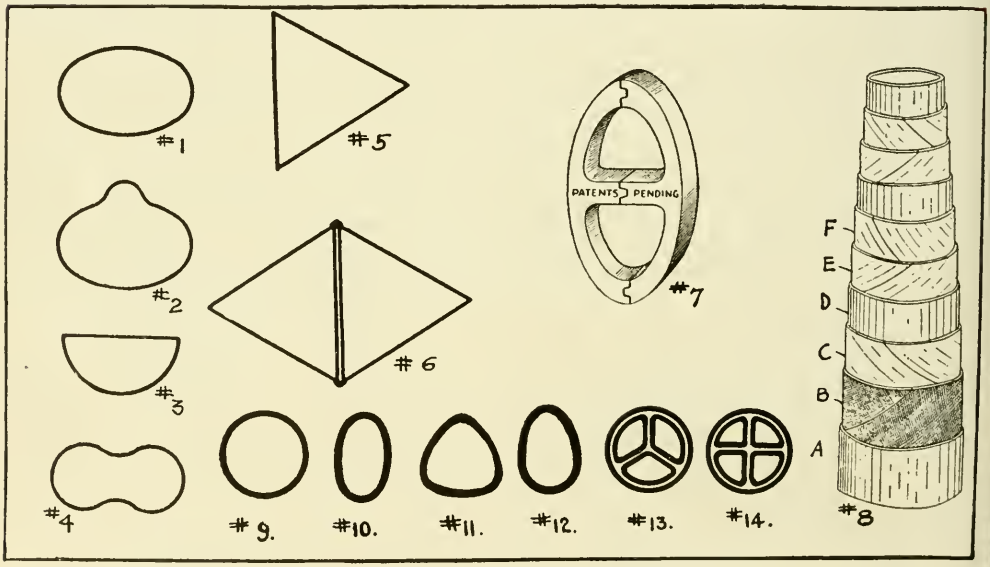
By O. Ursinus, C. E.

IN USELESS flying machine constructions, or other, some little item will be found which may be turned to good account by the experienced hand. Wood is used principally thus far in building aeroplanes, though very recently some structures both in America and abroad have been built of steel tubing. The advantage of wood is its light weight, great strength and easy-working qualities.

Lately some efforts have been made to improve on solid wood construction, by using wooden tubes, for instance. In Boston a hollow spar (Fig. 7) is being made and put on the market.

A man by the name of Wolf, in Germany, has invented a process for making wooden tubes of various cross-sections. This wood tubing consists of veneers 5 mm. thick, glued together. This method was described recently in *Flugsport*, an esteemed German contemporary. The grain of the veneer (A) runs in the direction of the axis; B is diagonally laid linen. C, D, E and F are veneers with counter-crossing grain. These constructions possess enormous firmness, as the following table will show:

No.	Diameter in Millimeters	Thickness of Wall in Millimeters	Weight for Running Meter in Grams	Pressure Resistance in Kilograms	Limit of Flexibility in Kilograms	Power to Resist Crushing Kilograms
1	20	4	225	150	70	85
1	25	4	275	200	85	105
1	32	4	410	300	130	145
1	45	4	530	500	200	230
1	55	8	1280	1000	500	530
2	36-16	4	290	250	120	135
4	36	4	375	300	135	145



The Wolf patented tubes may be made in any cross-section. Planes or whole bodies can be made from these veneers.

Steel tubing of various shapes has also been produced, as shown in Figs. 1 to 6. Figs. 3 and 4 are used for constructing ribs. Fig. 5 is used for body work, and may be used double or treble, as shown in Fig. 6.

Aeronautics in the Far East.

James W. Price, of California, who is traveling with a balloon, airship, hot air balloon, parachutes, etc., in the Far East, reports that the art is still in a somewhat backward state. In Hong Kong he made a balloon ascension in the presence of 15,000 people. From there he went to Medan in Sumatra, where he intended to make an ascent with his airship at the invitation of the "so-called" Medan Aero Club, but the club could not get together the necessary 4,000 guilders (about $1,600) to pay for the inflation. Sulphuric acid cost 6c. a pound and iron filings 3c., which is of interest to our own airship people. So the Medan Aero Club had to be contented with a hot air ascension. Subsequently he made a hot air trip for H. H. the Sultan of Lang Kat. From here his route lay through Penang, S. S., the Federated Malay States, Singapore and Java, where airship trips will be made.

THE ETEVE AUTOMATIC STABILIZER

TRANSLATED FROM "L'AEROPHILE."

By D. R. Hobart.

A NUMBER of investigations in the attempt to attain automatic longitudinal stabilization in aeroplanes have been made up to the present time, but one has been carried out on a machine in full flight. A public experiment made in this direction consisted of trials made at the military aviation grounds at Satory, near Versailles, France, under the direction of Captain Eteve, of the Sapper-Balloonist battalion, the aeroplane used being a Wright, with the addition of automatic stabilizers after the designs of the captain, constructed in the workshops of the Military Aeronautical Laboratory at Chalons-Meudon.

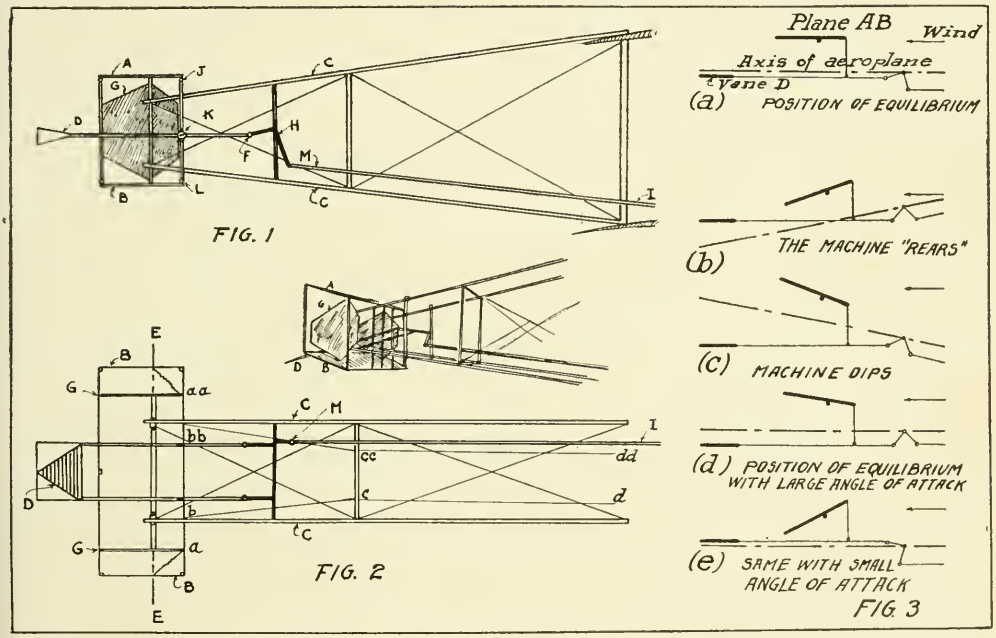
The first arrangement tried out at Satory was composed of two planes, *A* and *B*, movable on their axis *EE*. The axis *EE* is carried by a framework *C*, 3.5 meters in length, attached to the rear transverse members of the aeroplane surfaces. A horizontal vane *D*, movable on an axis *F* is connected to the planes *AB* by rods *KJ* and *KL*. The axis of the vane is firmly fixed to a tube *H*, controlled by a rod *MI* through a bell-crank *MHF*, this rod being in turn operated by a lever manœuvered by the pilot.

When the lever is fixed, axis *F* is immovable and the stabilizer vane struck by the wind, moves sensibly in the belt or layer of wind immobilizing the planes *AB*, which are compensated; the angle of attack of these planes is, then, invariable when the direction of the air current is constant. But when this latter varies, the movement of the vane is modified and the planes *AB* turn in a direction contrary to that of the vane.

In the "rearing" (*cabrage*) of an apparatus fitted with the stabilizer, the vane *D* is tilted and causes the planes *AB*, to turn in a direction contrary to their proper movement. This tends to correct or straighten out the aeroplane; when it plunges, the reverse effect is produced and the manœuvre is executed without interference, owing to the simplicity of the mechanism, a quality indispensable to an automatic stabilizer.

The planes *AB*, considered as depression rudders, automatically partake of the same movements as those resulting from the manœuvre made by the pilot of the aeroplane; moreover, the vane has the advantage over the aviator of acting simultaneously with the cause that produces the disturbance of equilibrium. In a word, the Eteve stabilizer opposes all variations of the angle of attack of the aeroplane as would be the case if a very long, light and instantaneously-acting empennage were fitted.

Under certain circumstances, it is necessary to be able to vary the magnitude of the angle of attack of the aeroplane, as when the inclination of the trajectory is to be modified, for example. To preserve the automatic action of the stabilizer, prior to, during and after the manœuvre effected by the pilot, the axis *F* of the vane can be raised or lowered by the aid of a lever under the control of the aviator. All displacement of *F* involves a change of equilibrium of the vane and consequently a modification of the angle of attack of the planes *AB* (Fig. 3, d and e). This indirect control of the stabilizer offers the great advantage of rendering the vane sensitive to exterior influences; the apparatus playing the role of depression rudder and stabilizer at the same time.



As will be seen from the figures, the rear vertical rudder of the Wright machine has been removed and replaced by two hexagonal planes *GG*, borne by the stabilizer framework and controlled by the spring-returned cables *a*, *b*, *c*, *d*, and *aa bb cc*, *dd* (Fig. 2). Wheels with spring shock-absorbers are fitted to the skids of the aeroplane.

When fitted to the aeroplane, the weight of the entire stabilizer "tail" is 25 kilogrammes (60.5 pounds), the additional weight carried by the aeroplane being 12 kilogrammes (26.4 pounds). The total surface of the stabilizer planes is four square metres (43 sq. ft.), half of the surface of the depression rudder of the Wright aeroplane, consequently if the stabilizer planes are rigid and will be as equally unstable as a Wright aeroplane when one of the two surfaces of the forward rudder have been removed. The flights at Satory have demonstrated in a complete manner, the important role played by the stabilizer.

(*Continued on page 188*).

THE PRESSEY AUTOMATIC CONTROL

A SYSTEM for automatically maintaining the equilibrium of an aeroplane has been patented by Dr. B. J. Pressey, of Newport News, Va., in several foreign countries, and patents are pending in others as well as in the United States.

In the patent drawings reproduced herewith the device has been fitted to a biplane using ailerons for lateral, and horizontal rudders for longitudinal, stability. The system is designed to be adapted to any type of aeroplane.

The aeroplane is equipped with a manually operated, vertical rudder, 3, at the stern, and a horizontal, manually operated, front control, 4, in front. At the ends of the main plane, and about midway between the upper and lower sections thereof, there are supplemental planes, 5.

In connection with these supplemental planes 5, there is employed a gravity influenced weight, the aviator in his seat, for holding them in a horizontal, or substantially horizontal, position when the main plane is traveling on an even keel: and for causing them to tip when the main plane dips laterally, to port or starboard, the planes 5 having a lifting effect upon the depressed

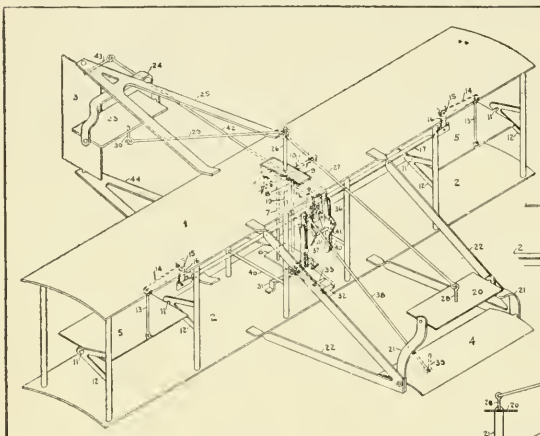


Fig. 1

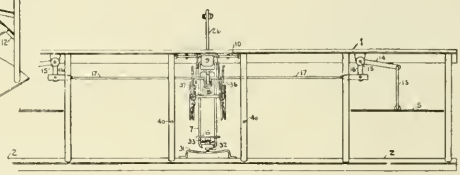


Fig. 2

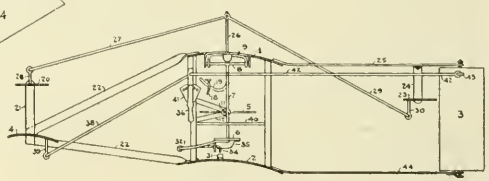


Fig. 3

The Pressey Automatic Control

end of the main plane, and a depressing effect upon the lifted end of the main plane, so as to correct such lateral dip of the main plane, and restore it to an even keel.

The aviator's seat, 6, is carried by yoke 7, suspended from a fore and aft shaft, 8, the latter being pivotally mounted in bearings at ends of bar 9 which is secured to a transverse shaft, 10, pivotally mounted at its ends in suitable bearings attached to the main plane 1, thus providing a gimbal joint, which permits free tipping movement of the main plane in any direction, in respect to said seat; the seat having a normal tendency to hang vertically by reason of the effect of gravitation upon the weight, represented by the seat and its occupant. Lateral tipping of the main plane is caused, to effect corrective movement of the balancing planes 5, in the following manner: Each of the balancing planes 5, is pivotally supported, somewhat forward of the centre by bearings 11 located in bracketed arms 12, which arms are rigidly connected with uprights, which connect the upper and lower sections of the main plane.

To the forward, upper edge of planes 5, connection is made by means of rod 13, to one arm of a bell-crank lever, 14, the latter being pivotally mounted upon a fore and aft pin 15, supported from the main plane: and the other arms of the port and starboard bell-crank levers 16, are connected by rod 17, which has an eye 18, for receiving the segmental rod 19, secured to and projecting from cross bar on seat supporting yoke 7. When therefore, the main plane tips downwardly on the starboard side, the rod 17 will be moved bodily to starboard, and the starboard balancing plane 5, will be inclined so as to raise its forward edge and depress its rear edge, while, at the same time, the port balancing plane 5, will be inclined so as to depress its forward edge, and raise its rear edge, thereby causing the starboard balancing plane to exert a lifting effect, and the port balancing plane to exert a depressing effect upon the main plane, with the result of restoring the main plane to an even keel, at which time the balancing planes, 5, will have resumed their normal, horizontal position.

When the main plane dips downwardly on the port side, a reverse action takes place, with the like result of restoring the main plane to an even keel. In order to correct forward and aft dip of the main plane, fore and aft balancing planes, 20 and 23 are provided. These planes are carried by transverse rock shafts, which may be pivotally mounted in any suitable way, upon structures carried by main plane. In the present instance, the forward balancing plane is pivotally mounted in extensions 21 of the frame 22 which carries the forward, manually operated, horizontal ascending and descending plane 4.

The aft balancing plane 23 is pivotally mounted in extensions 24 from frame 25 which carries the vertical steering plane 3. Projecting upward from bar 9 is an arm 26, which is connected by rod 27 to an arm 28 projecting upwardly from forward balancing plane 20 and by rod 29 to an arm 30, projecting downwardly from aft balancing plane 23.

When, therefore, there is a downward tip of the forward part of the main plane, retention of its vertical position by the arm 26 will cause the forward balancing plane, 20 to tip so as to raise its forward edge and depress its after edge; while at the same time the after balancing plane, 23, will tip so as to depress its forward edge and raise its after edge, with the result that there will be a lifting effect on the fore part of the main plane, and a depressing effect on the after part of the main plane, which will restore said main plane to an even keel. A

reverse action takes place when the after part of main plane has a tendency to dip. In case the aeroplane departs from an even keel, and dips for instance, forwardly and to one side, all four balancing planes would immediately be brought into action.

In ascending and descending, however, departures from the normal inclinations of the main plane are necessary and in order that the forward and aft balancing planes 20 and 23 shall not interfere with voluntary descent or ascent, the aviator's seat should, in making such ascent or descent, virtually be locked to the main plane, so far as allowing forward and aft motion of seat.

To secure this result, there is employed what may be termed a sliding-bar 31, firmly secured to lower section of main plane and parallel to the lateral swing of the aviator's seat. To the ordinary foot rest 32, connected with the aviator's seat, a supplementary foot rest 33, is hinged and this supplementary foot rest carries an extension which ends in a lug 34, which lug normally swings just above and free of the sliding-bar 31, being held in this position by a light spring 35.

In case the aviator wishes to ascend, he places his foot upon the supplementary foot rest; the weight of the foot overcomes the force of the spring and allows the lug to be carried down and in front of the sliding bar, thus rendering neutral for the time being the forward and aft balancing planes. During such time, the forward and aft balance would be under the operator's control by means of the manually operated plane 4. In case of voluntary descent the lug 34 is dropped behind bar 31, until such voluntary descent is ended.

It is absolutely necessary, in making a turn with an aeroplane, if that turn is to be made in safety, that the main plane shall be inclined or "banked," to a degree proportional to the radius of the curve and to the speed of the aeroplane. Each different curve, at the same speed, demands a different inclination, as is also demanded by each variation in speed in rounding like curves. This invention is expected to give the desired result with absolute certainty.

If the aviator desires to make a turn to the right, he would first manipulate the vertical rudder 3, by means of lever 36. The aeroplane would begin to make the turn.

At this instant, centrifugal force would come into action and cause the aviator, in his seat, to swing outwardly to an extent just in proportion to the radius of the curve, and the speed of the aeroplane. The outward swing of the aviator's seat causes the port balancing plane 5, to be so inclined as to present its under surface to the air pressure, whereas the upper surface of the starboard plane is presented. This would immediately cause an inclination of the main plane to the degree where said main plane would be at right angles to the suspended weight, the aviator in his seat, thus allowing this special curve, at this particular speed, to be negotiated with safety.

If it is desired to make a curve of less radius or at a greater speed, centrifugal force, acting upon the suspended aviator's seat, will cause it to swing out to a correspondingly greater extent, thereby causing the main plane to be banked to a greater degree.

LETTER TO AERO CLUB MEMBERS

THE following letter was received just before going to press. AERONAUTICS will gladly devote such space in subsequent issues as may be required for letters of suggestion or aid in co-operating with other members for a betterment of conditions in the Club, and for the making of it a more serviceable institution.—*The Editor.*

New York, Oct. 15, 1910.

To the Members of The Aero Club of America:

The article which appeared in to-day's papers stating the view expressed by Mr. Moissant, who declares that this country is far behind France in Aeronautics, is so eminently well founded upon fact that it naturally causes one interested in the advancement of the art in this country to pause and think. It appears that hundreds of aeroplanes have been made and sold as well as hundreds of pilots' licenses issued in France. Can it be that there are so many of those things which have been done which should have been left undone and so many of those things which have been left undone which should have been done in the short history of American aeronautics that we are at last forced to the realization of our own shortcomings by the advanced condition of aeronautical affairs in France?

Concerted effort is naturally dependent for success upon proper organization. The real head of the art, the Federation Aeronautique Internationale, is recognized in France through the Aero Club of France, and is recognized in the United States through the Aero Club of America. This seems to put it up to the Aero Club of America to explain why they cannot accomplish as much with American genius and capital as has been accomplished with Frenchmen under the same system of operation. In the solution of the problem the following questions arise:

Can it be that the form of government of the Aero Club of America is too autocratic to be compatible with the democratic spirit of our American institutions?

Why is it that the Aero Club of America never holds regular meetings for enabling its members to get better acquainted and to co-operate?

Is the International Aviation Meet to be held at Belmont Park under the auspices of the Aero Club of America; and if so, why is it the members have not been enlisted or consulted?

Why does the Aero Club of America not own and control its property directly instead of through the Aero Corporation, which is governed by the same five men who originally owned and controlled all the property of the Club to the exclusion of the members?

Why did the Aero Club of America assume the responsibility of entering into such an important contract as that which was made with the Wright Company considering that it might have seriously checked progress in the art of aviation, without first consulting the members?

Why has a democratic National Organization of Clubs not been encouraged?

Why have the members not been invited to take part in Club affairs?

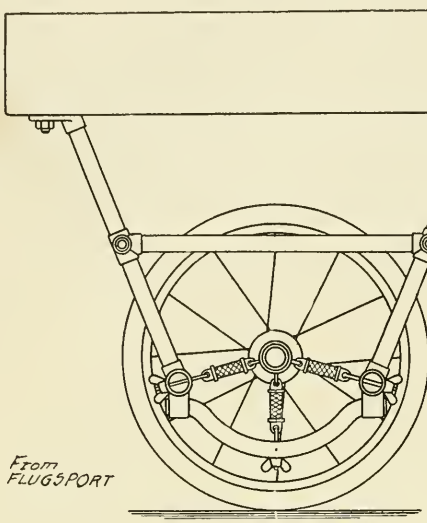
I take this means of reaching the members of the Aero Club of America as there seems to be no other way of bringing these vital points before them.

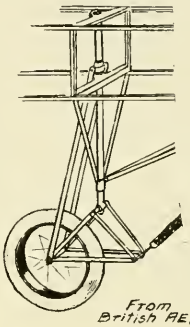
Yours respectfully,

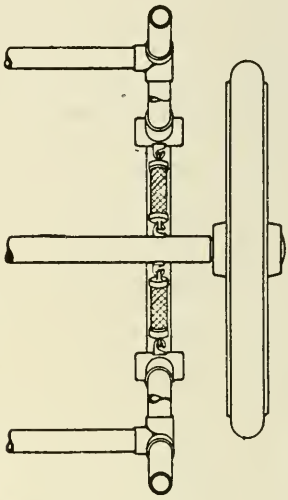
LOUIS R. ADAMS.

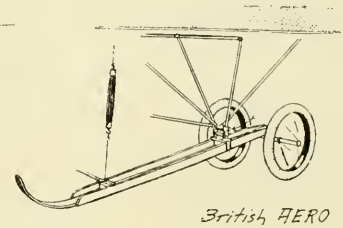
Dr. Luzern Custer, of Dayton, O., has presented Leo Stevens with one of his new design statoscopes, which Dr. Custer described and illustrated in a recent issue of AERONAUTICS. The article of Dr. Custer was translated and printed later in one of the German aero magazines. Stevens used this on the first occasion and pronounced it the finest instrument of its kind yet invented. Clifford B. Harmon also tried it and with great success.

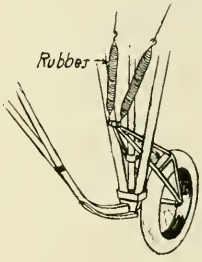
CONSTRUCTION AIDS AND DIGEST, XVI.

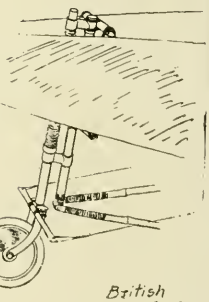


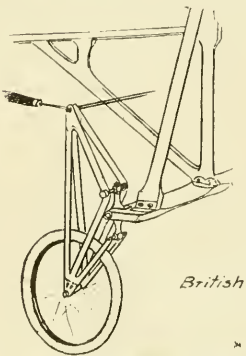


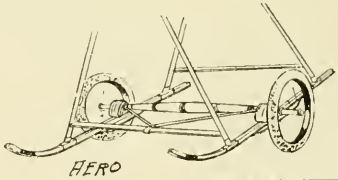


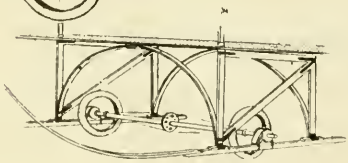


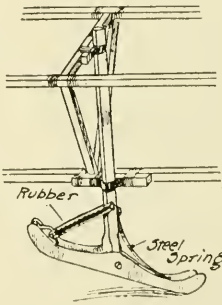


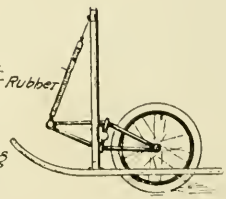












THE MISSING LINK IN AERONAUTICS

By John D. Pursell.

PUBLICATIONS which, a short time ago, searched the dictionary for conservative words, when they touched on aeronautics, now give full play to their imaginations, and seldom fail to work in something like this: "We have the aeroplane now only in its infancy. One may be sure that improvements will be made in the machine such as are not now dreamed of," etc., etc. However, they never commit the indiscretion of naming any general lines along which this miraculous development will take place. The modest purpose of this article is to point out precisely that opportunity for development. The facts will speak for themselves.

It seems almost incredible, but it is, nevertheless, true that some very homely and everyday laws of Mother Nature have been studiously ignored by the elect, like the ugly duckling, because things have prospered very well, so far, without them. I refer to Inertia, that property of all ponderable bodies (including air); and its accompanying factor, Accelerating Velocity. These two potent influences are destined to play a very important part in the development of all aerocars—helicoptere and flapping-wing devices, as well as the aeroplane. Consideration for your patience constrains me to limit my comments to the aeroplane, alone.

Does the present aeroplane exhibit that graceful impression of reserve strength that stands forth so strongly when a touring car purrs lazily over a small hill? Verily, I trow not. Rather let us think of a seven passenger car, equipped with a bicycle motor, nearly stalled on the car tracks in front of a rapidly moving street car. Where is the exhibition of magnificent reserve power for emergencies? I submit that the mental attitude of the driver in either case is very similar. They both must win out by virtue of personal skill alone.

Suppose for a moment that the 50-horsepower Curtiss bi-plane required but one horsepower in level flight. Wouldn't this solve all the essential problems of safety, reliability and commercial usefulness simply because of the tremendous, fifty-nine hundred per cent. reserve power absolutely under the operator's finger? The mastery of adverse elements would be unutterably simplified. This is not an idle supposition. It is advanced merely to illustrate graphically the truly marvelous advance which will accrue from any considerable economy in horsepower consumption over the present figures.

The most efficient aeroplane of to-day carries about 50 pounds for every horsepower actually delivered at the propeller. A 25-pound bird, however, instead of expending half a horsepower, exerts scarcely a tithe of that energy. Let us investigate this discrepancy.

Motors have reached practical perfection, as far as small weight per horsepower is concerned. Lighter motors cannot be expected to exhibit the reliability so vital to the successful aeroplane. Instead of crowding the motors, let us look rather to the sustaining planes and see why they are so inefficient when compared with their prototypes in nature.

In the standard plane of to-day, the approximate angle of incidence is about 6 degrees. At 6 degrees, the drift or head resistance developed during flight (exclusive of framing, etc.) is about one-tenth of the total weight carried. To be exact, for every 206 pounds lifted, there are 21.7 pounds of drift, which, multiplied by speed of the machine, and figuring an allowance for loss in transmission, etc., represents the horsepower required to carry the 206 pounds. It is perfectly clear that if we can design a sustainer capable of producing the necessary lift, with speed and wing area remaining the same, at only a fraction of 6 degrees angle of attack, we will need only a fraction of the horsepower now required to carry the weight with planes set at 6 degrees.

Such a sustainer is described below:

In the first place, the vitally important factor, that which every flying creature employs to sustain itself, rarefaction over wings, body and tail, is almost totally disregarded in the present design. (This does not appear quite consistent in view of the general acceptance of the fact that there is rarefaction over the tops of aeroplane surfaces.—Editor.) A study of the transverse vertical section of a bird's wing will show that defective pressure must exist during flight, over a large portion of its upper surface, after a certain forward velocity is attained. The wing moves edgewise through the air, and the air passes parallel with the under wing surface. The air stream divides at the thick front edge of the wing, and the portion of the air stream represented by the thickness of the wing, is deflected upward and over the upper surface by the wing's curved forward section, the extreme forward edge of which is nearly on the same plane as the under surface of the wing. This air thrown upward by the wing's curved edge, cannot reverse instantly and maintain close contact with the upper surface of the wing, on account of its inertia. The air pressure, therefore, drops below atmospheric, between the passing current of air and the wing's upper surface, the space between being filled by eddies at a pressure below that existing in the free air (to be found underneath the wing) the degree of rarefaction depending on the speed and the degree of their inclination to each other. This, of course, somewhat resembles the "slip" of a propeller.

How slight the degree of rarefaction, required for flight is at once apparent when we remember that we require only two to four pounds lift per square foot, whereas an absolute vacuum, were it possible to obtain it, would yield about one ton to every square foot of surface.

A satisfactory demonstration of the importance of defective pressure may be obtained by taking an ordinary box kite and removing the vertical planes, thus allowing the outer air to be drawn into the rarification forming over the lower planes. The loss in lifting power of the kite will be apparent. On the other hand, by extending the vertical keels a slight distance above the upper horizontal planes, thus protecting the rarification forming over the upper planes, from any side currents, the increase in lifting power of the kite will be noticeable.

In the face of the above, we must agree that proper conservation of the rarification above a sustainer is essential to economy of energy in flight.

Now we come to a factor in the proposition, which seems to have been ignored heretofore, viz: The efficiency of a sustainer varies inversely as the fore-and-aft dimension.

Referring to diagram: The dotted curve 2 3 represents the line of equal rarefaction, produced by the air stream in flowing over the wing 4. The space 5 indicates the useful rarefaction, which corresponds somewhat to the "slip" of a propeller. This line 2 3, must represent an increasing downward velocity, because air possesses weight, and consequently, inertia. This is self-evident. As this is an accelerating downward velocity, the distance 6 7 must be only one-sixteenth of the distance 8 9 because it is one-fourth as far back from the front edge of the wing. If the accelerating velocity factor is admitted (and it cannot well be denied) the distances 6 7 and 8 9 must compare as the squares of their distance back from the front wing edge.

The expansive power of air affects the rate of acceleration, but it has nothing to do with the ratio, and it is the ratio with which we are dealing.

The distance 8 9, being sixteen times as great as the distance 6 7, the average angle of incidence for the large wing is four times that re-

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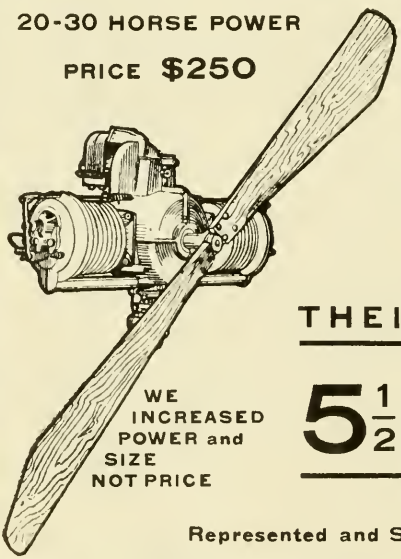

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quired by a quadruplane, consisting of four planes measuring the same as 2 7, superimposed. Though the distance 8 9 is sixteen times the distance 6 7, the radius of its arc 2 8 is, of course, four times the radius 2 6, hence the *degree* of incidence is not sixteen times as great, but only four times.

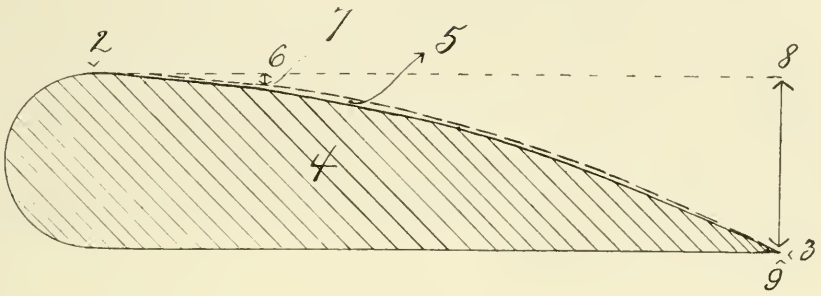
Inasmuch as the efficient angle of incidence for the quadruplane is only one-fourth the angle required by the monoplane, it will lift an equal weight, at same speed, but requires only one-fourth as much horsepower as the large monoplane.

Reference to the diagram will show that an octoplane would yield eight times the efficiency—requiring but one-eighth the horsepower to perform the work, etc., etc.

Therefore: Efficiency of a sustainer varies inversely as the fore-and-aft dimension.

sustainers will require but one horsepower for every twelve in the present machines—quite a saving, we must admit. The 206 pounds mentioned above, would be levitated with only 1.8 pounds head resistance, instead of the 21.7 pounds required with the larger plane. And this, too, with no increase in wing area or speed. This means we can figure about 600 pounds carrying capacity to each horsepower—which opens up vast possibilities in the commercial machine.

As an angle of incidence equal to but one-twelfth of the original 6 degrees—namely, one-half degree—would prove impractical with the present form of aerocurve, we substitute the natural design found in a bird's wing. The flat lower side is to pass parallel with the lower air stream; the thick forward edge divides the two air currents, and the sloping upper surface



Or: The angle of incidence varies directly as the fore-and-aft dimension of a sustainer.

Also: A number of corollaries, but they are so obvious that I will not take space to set them forth. One would deal with Prof. Langley's paradox (?) of economical high speeds. That is, a plane driven at quadruple speed requires only one-fourth the angle of incidence (we see why from above diagram), therefore developing four times the speed at no additional expense in horsepower.

In other words, there is an intrinsic advantage derived from the narrow planes—and no apparent disadvantages—even constructional, for stronger machines may be built by reason of their cellular compactness.

Constructional limitations will discourage the use of planes much under 6 inches deep. Compared with the present 6 foot deep planes, these

corresponds to the angle of incidence, yielding the lift, through rarifaction and minus pressure. And it is this minus pressure that does the work, anyway. This thick wing cannot be taken aback at the front edge, when held at small angles, like the present aerocurve would be.

A multiplane possesses intrinsic fore-and-aft stability. By designing the "vertical" bracing like the sustainers, and arranging them at dihedral angles, we may practically eliminate idle head resistance in the wings, and the lateral stability will also be automatically increased.

With moderate application of the proposition: "Efficiency varies inversely as the fore-and-aft wing dimension," and its corollaries; together with proper conservation of the rarification above a wing, we usher in the era of true flight. The commercial flying-machine is now a probability. Excelsior!

Aero Calendar of the United States.

Oct. 17.—St. Louis, Mo., Gordon Bennett balloon race.
Oct. 22-23.—Ft. Wayne, Ind., 2 Curtiss machines.
Oct. 22-30—Belmont Park, L. I., international aviation meet, including Gordon Bennett aviation race, latter on Oct. 29.
Oct. 22-23—Novice meet of A. C. of California.
Oct. 28-Nov. 1—Macon, Ga., Wright aviators.
Nov. 1-3— Norfolk, Va., 3 Curtiss machines.
Nov. 2-8—Baltimore, Md., open meet.
Nov. 2-12—Philadelphia, Pa., aero show of Pennsylvania A. C.
Nov. 17-24—St. Louis, Mo., Coliseum aero show.
Dec. 1-8—Aero Show of A. C. of Illinois.
————Streator, Ill., Chas. F. Willard.
————Mobile, Ala., Curtiss aviator.

Chattanooga Wants Meet.

The Chamber of Commerce, of Chattanooga, Tenn., is desirous of communicating with aviators for the organization of a meet or exhibition. Correspondence is solicited.

$32,700 For Baltimore Flights.

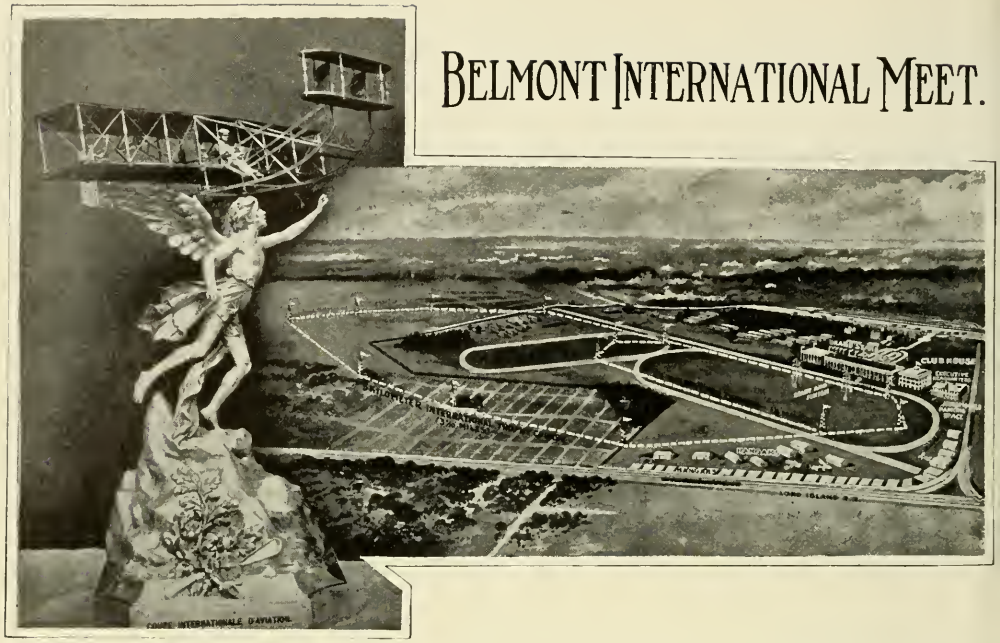
Baltimore has arranged for an aviation meet Nov. 2 to 8.

The aviation committeee has arranged the tentative list of prizes as follows: Lord Baltimore prize, $10,000; greatest speed, $5,000; altitude, $5,000; duration of flight, $3,500; longest distance flown, $3,500; slowest flight, $1,500; getaway, $200; accuracy, $500; bomb throwing, $3,500; a total of $32,700. In addition to these, prizes will be offered for amateurs, while J. Barry Ryan has offered the Commodore Barry Cup for bomb throwing, this to be open only to members of the Aeronautic Reserve and foreigners.

Dinner to Curtiss.

The best aeronautical dinner that has yet been given was tendered Glenn H. Curtiss and his flyers, J. S. Mars and J. A. D. McCurdy by the Aero Club of Cleveland (O.), on October 12. Forty-three people attended the banquet, including the Mayor of Cleveland, president of Chamber of Commerce, and other leading men. E. W. Roberts, of the Roberts Motor Co., was one of the speakers.

BELMONT INTERNATIONAL MEET.



AS we go to press the arrangements are about completed for what promises to be the most extraordinary meeting yet held in America. The "International Aviation Tournament" at Belmont Park, Long Island, New York, from Oct. 22 to 30, inclusive, offers total cash prizes amounting to $67,300, to be competed for under the rules and regulations of the Federation Aeronautique Internationale.

The Gordon Bennett race, perhaps, is the principal feature of the meet and is the primary cause of its being held. A year ago, Aug. 28, G. H. Curtiss won the cup at Rheims, France, making the fastest time for 20 kilometres, 15 minutes 50 3/5 seconds, a speed of 47.06 m. p. h.

In the 1910 Gordon Bennett cup race, Oct. 29, $5,000 cash goes to the winning aviator (and the silver trophy to the club of the country represented by him) making the fastest time for 100 kilometres (62.1 miles) flown over a course of 5 kilometres (3.1 miles).

LIST OF ALL CONTESTS.

RYAN PRIZE, $10,000. Donated by Thomas F. Ryan, to be awarded to the aviator who shall make the best elapsed time in a flight starting at Belmont Park, around the Statue of Liberty, in New York Harbor, and return to the starting line; open to all competitors who shall have remained in the air in one continuous flight one hour or more, during the previous contests of the tournament. This contest is scheduled for Thursday afternoon, October 27.

GORDON BENNETT ELIMINATION RACE, first, $1,200; second, $800; third, $500; total, $2,500. To select representatives of America in the Gordon Bennett race. Open only to aviators having pilot licenses. Distance 100 kilometers, over circuit of 5 kilometers. Three machines making fastest speed to represent America.

HOURLY DISTANCE PRIZE, first, $250; second, $100; third, $50; for each one of 12 hours, total, $4,800. One hour set apart each day for hourly distance and altitude contests.

HOURLY ALTITUDE PRIZE, first, $250; second, $100; third, $50; for each of 12 hours, total, $4,800.

DAILY TOTALIZATION OF DURATION PRIZE, first, $500; second, $250; third, $100; for each of seven days, total, $5,950.

FASTEST FLIGHT FOR TEN KILOMETERS, first, $1,500; second, $1,000; third, $500; total, $3,000. Over four laps of 2,500-metre course.

GRAND ALTITUDE PRIZE, first $2,000; second, $1,000; third, $500; fourth, $250; total, $3,750. $1,000 additional for world's record.

AERO CLUB OF AMERICA ALTITUDE PRIZE, $5,000. Altitude must be 10,000 feet or more.

GRAND SPEED PRIZE, first, $3,000; second, $1,000; third, $500; total, $4,500. Distance, 25 kilometers (10 laps).

CROSS COUNTRY FLIGHT, first, $500; second, $250; third, $100; on each of four days, total, $3,400, awarded for best speed.

CROSS COUNTRY PASSENGER CARRYING PRIZE, $2,000. Awarded for best speed with passenger weighing not less than 125 lbs.

PASSENGER CARRYING PRIZE, first, $1,000; second, $400; third, $200; total $1,600, to be awarded to aviator carrying greatest weight of passengers twice around 2,500-metre course.

TOTALIZATION OF DURATION PRIZE, first, $3,000; second, $1,500; third, $1,000; fourth, $500; total, $6,000. Awarded for greatest total duration during meet.

TOTALIZATION OF DISTANCE PRIZE, first, $1,500; and second, $1,000; third $500; total $3,000. For greatest total distance during meet.

MECHANICS PRIZE, $1,000.

DISTRIBUTION OF PROFITS. Aviators participate to the extent of 70 per cent. of the first $100,000 profits, and 40 per cent. of any sums beyond; the aviators sharing this on a system of points.

OTHER PRIZES. *Scientific American* trophy for the longest flight made in 1910 in America. *Michelin* trophy and $4,000 cash for the longest flight in

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and we had intended to have a picture of Curtiss on his flight from Albany to New York when he used an EL ARCO RADIATOR with perfect results, ***and*** another picture of J. J. Frisbie with the first twin EL ARCO RADIATOR installation, ***and*** a well-worded advertisement asserting in terse, crisp sentences that the EL ARCO was the lightest, strongest, most efficient radiator ever devised and that the sharp cutting edges of the tubes and the compactness of the radiator minimized the obstruction to the air, and that therefore there was no other radiator so well adapted to cooling aeroplane engines as ours.

We had intended to claim that we were the first in this country to show a radiator especially made for aeroplane work with special metal throughout and individual caps and fittings, and to remark that E. R. Hewitt, a member of this firm, the well-known designer of engines, who has been experimenting scientifically with the problem of engine cooling for years, laid out the formulae which we adopted for determining the sizes of EL ARCO RADIATORS for aeroplane engines.

In fact, we proposed to blow a very loud blast indeed on our own trumpet, and impress on your mind the facts that Baldwin, Beach, Curtiss, Frisbie, Gill, Dr. Greene, Russell and Wilcox, to name a few of the well-known men, all use the EL ARCO RADIATORS, and the Boulevard Engine Co., Elbridge Engine Co., Emerson Engine Co., Rinek Aero Mfg. Co. are some of the engine builders who have adopted the EL ARCO as part of their standard equipment.

All over now—You won't read this—No hope of your remembering that the EL ARCO RADIATOR is absolutely what it is represented to be as regards weight, efficiency and workmanship; that its guarantee is absolute and that our services in any problem of radiation are entirely at your disposal—And all because we were too busy keeping our promises to attend to our own interests. Just look out next time!

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¶ Remember Fox Marine Motors hold the world's endurance record for motor boats, and even our first aero motors have commanded instantaneous attention by their remarkable and consistent performances.

¶ Fox Aero Motors are made in six sizes, 24 to 150 H. P., four, six and eight cylinders. Full details and prices on application. Deliveries guaranteed.

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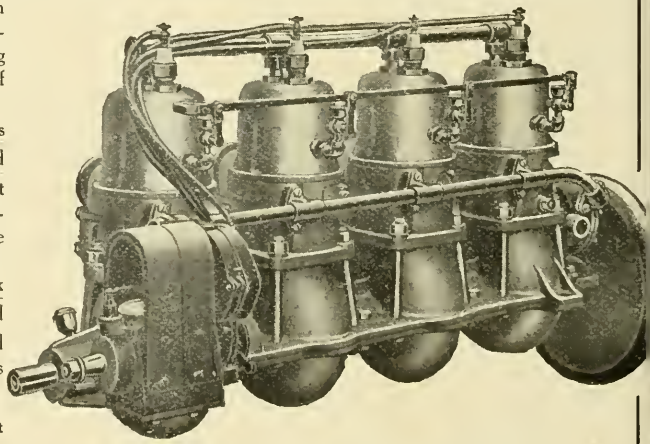

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closed circle during the year. It is necessary to xceed 244 miles made by Olieslagers at Rheims st July. Silver cup, value $1,000, to the *amateur* hose total duration for flights during meet shall greatest providing it exceeds five hours.

ENTRIES.

France—Count Jacques de Lesseps (Bleriot), fred Leblanc (Bleriot), Hubert Latham (100 h. p. ntoinette), Rene Barrier (Bleriot), Emile Aubrun Bleriot), Rene Simon (Bleriot), Roland Garros Clement-Bayard Demoiselle), C. Audemars (Nieuport).

England—C. Grahame White (Farman and Blepot), James Radley (Bleriot), Alec Ogilvie Wright).

America—Ralph Johnstone (Wright), Walter ookins (Wright), Arch Hoxsey (Wright), Chas. Hamilton (Hamilton), Capt. T. S. Baldwin Baldwin), Tod Shriver (Shriver), John B. Moisnt (Bleriot), J. A. Drexel (Bleriot), C. B. Harn (Farman), H. S. Harkness (Antoinette), C. F. illard (Curtiss), J. C. Mars (Curtiss), J. A. D. cCurdy (Curtiss), Eugene Ely (Curtiss).

The majority of the Bleriots are fitted with 50 p. Gnomes. Barrier is bringing over the 100 p. Gnome-engined Bleriot used recently by orane in making his world speed record of 66.18 les an hour. Hamilton has a 110 h. p. engine.

Curtiss has built a new engine of 64.8 h. p. . L. A. M.) and there are some new machines Hammondsport.

The Wright Company is known to have a fast achine. Ogilvie has been at Dayton for some- ne practicing on a Wright.

All are monoplanes except the Farman, Wright, milton, Baldwin, Shriver and the Curtiss maines, if any are entered.

Five Wright machines are promised for the meet m the Wright Company. Three are sure of being esent.

Garros is a new aviator. His first notable flight s on Sept. 9, when he flew some distance across ntry; with another of 15 kil. on the next day.

GORDON BENNETT ELIMINATION.

Entries for this made to date, October 14, inde Hamilton, Moissant, Drexel, one Wright mane, Harmon, Baldwin, and Harkness.

n the Gordon Bennett race, Leblanc, Latham and e yet to be named, possibly Simon, will fly for nce. England has named White, Radley and Ardle (Bleriot).

Trial flights of the Latham 100 h. p. Antoinette showed up a speed of 69.5 miles an hour.

THE FIELD.

On the flying field, with its two miles of grassy level, 14 gayly colored pylons trace the aerial course. Starting in front of the Grand Stand the flying gladiators will give a near view of their airmanship. Each aviator has his distinctive style of launching and alighting. The machines, after turning the last pylon, will approach the grand stand at a speed of a mile a minute, increasing this as they sweep past the crowds.

A brilliant period of preliminary flying will occupy the three or four days before the Tournament. The hangars, or sheds, in which the racing monoplanes and biplanes will be housed, have been finished. Aviators have begun "tuning up," trying out motors and testing the stability of their craft, in the air. Three-quarters of a mile across the green flying field, the 30 hangars and repair shops are lively with corps of expert mechanics, who will live there during the entire flying season. "These stables" have already become a center of interest for hundreds of experts on flying.

The cross-country flights will be out and around captive balloons furnished by Leo Stevens.

COST OF SEEING THE SHOW.

A number of boxes and parking spaces are reserved for members of the Aero Club of America and tickets for the same can be obtained of the Aero Corporation, Ltd., Room 1101, Fifth Avenue Building, New York, at the following prices: Boxes seating six or eight are $30.00 and $40.00 respectively per day. Club-house badges with full privileges of the house and grounds with one lady guest, are $50.00 for the entire meet. Reserved seats, $2.50 per day; admission to grand stand $2.00; admission to field stand, $1.00. Parking spaces $5.00 per day and $2.00 per person, including chauffeur.

Curtiss Machine in Gordon Bennett.

New York, Oct. 17, 1910.—It is now definite that there will be a Curtiss aeroplane in the Gordon Bennett race. This will be a single surface machine, with a new 8-cylinder engine. G. H. Curtiss will not fly the machine himself. Curtiss has the privilege of defending the cup without entering into the elimination trials, but as he will not fly the machine it is indefinite whether the aviators who do fly it will be permitted to go into the race without going through the trials. There will be at least two other Curtiss machines of regular type. Willard, Mars, McCurdy and Ely have all been entered.

XHIBITION FLIGHTS OVER THE COUNTRY

SPRINGFIELD, Mass., Sept. 17.—Louis G. ickson, of Springfield, Mass., made several flights the Sturbridge Fair on Sept. 17, in his Curs type machine. Four short flights were made ross the field of the race track. The condition the field was horrible, with a pond, a swamp l bumpy grounds to run over. The flights were de with a propeller, which had a piece knocked of it by a wrench which dropped into it while motion.

KNOXVILLE, Tenn., Sept. 22-28. P. O. Parmelee one of the new Wright aviators, flew at least ce every day at the Appalachian Exposition.

DETROIT, Sept. 19-25.—Hoxsey and Johnstone their Wright machines every day according the schedule.

Chas. J. Strobel had a dirigible there. Parmelee s a great success as a flier. Some of his flights ted 30 minutes, and in all of them he indulged "roller coasting" and other stunts.

ALLENTOWN, Pa., Sept. 20-24.—G. H. Curtiss J. A. D. McCurdy were scheduled to fly. On ount of the dangerous grounds Curtiss refused allow McCurdy to fly. Curtiss flew over part the town. It was advertised that he would to Philadelphia. The only possible route, with- going over the mountains, was full of dangers and 120 miles in length, so the flight was given up.

OLEAN, N. Y., Sept. 22-23.—Chas. F. Willard (Curtiss) gave exhibition flights. In starting a flight, a piece was chipped out of his propeller, but bad ground made it necessary to keep going. The loss of blade surface on one side rocked the machine so that every wire was loose on landing.

TRENTON, N. J., Sept. 26-30.—Ralph Johnstone flew every day in accordance with his contract, meeting with the greatest enthusiasm on account of his wonderful control.

HELENA, Mont., Sept. 26-Oct. 1.—J. C. Mar's flights at Helena were very successful. The governor of the state presented him with a gold watch and nugget fob. Helena has an altitude of 4,100 feet. This is the highest that a Curtiss machine has flown, as far as known.

Mars essayed a flight across the Rocky Mountains for a prize offered by Ringling Bros., the circus men. After some hours searching parties found the dismantled machine near the top of the range. Fortunately, Mars escaped injury. The right hand plane, front wheel and propeller were smashed in alighting, but the machine was brought back. His altitude above sea level is reported to have been 7,500 feet, a new American record.

CHICAGO, Oct. 1-9.—Curtiss, Ely, Willard, McCurdy and Post were the flyers at an exhibition conducted by the Chicago *Post* on a profit-sharing basis. Willard and Curtiss both made fine flights. Willard made a sensational one over a part of the city and went to a height of 4,000 feet. He slowed up his motor and swooped down over Jackson Park, then up again to the grounds at Hawthorne track. Augustus Post did here his best flying to date. Two days of rain prevented flying.

ELY STARTS FOR NEW YORK—GOES BUT 19 MILES—ATTEMPT GIVEN UP ON ACCOUNT OF LACK OF TIME.

Eugene Ely, with the new 8-cyl. machine used by Curtiss at Boston, left on the 9th on an attempt to reach New York. After going about 12 miles at an altitude of 1,500 feet, the carburetor gave trouble and a landing had to be made at Beverly Hills.

This was fixed, the motor started and spectators helped to start the machine. In getting off the front wheel hit a hidden rock and smashed the wheel.

The next day, the 10th, he did not get off the field when the gasoline feed pipe broke and he landed in a brook, smashing the whole front construction. This was fixed in a hurry and he got going again and flew for 25 minutes. The motor went dead in the air and he glided down from a height of 2,000 feet. In landing he smashed the front control again, and the distance from the start was but 19 miles, at East Chicago. So much time had elapsed that it was not deemed advisable to try to continue.

Miss Blanche Scott made her debut with a Curtiss machine during the week.

The time limit of the prize offered by the New York *Times* and the Chicago *Post* is up on October 16. Present plans do not provide for keeping the offer open after that date.

SEDALIA, Mo., Oct. 1-7.—J. C. Turpin, the latest addition to the Wright staff of aviators made his first public flight at Sedalia on the 1st, and flew every day but one during the week.

SPRINGFIELD, Ill., Oct. 1-8.—Hoxsey took the machine Brookins used in his Chicago-Springfield flights and created great enthusiasm during the week. On the last day he made his great flight to St. Louis.

RICHMOND, Va., Oct. 3-8.—Ralph Johnstone filled the engagement successfully, rain preventing his flying on the 5th and 6th. A rather peculiar accident happened while flying on the 5th. The Mayor of Richmond, as passenger, in his enthusiasm in waving at the crowd struck the motor control with his arm and shut off the motor just as they were rising from the ground. Johnstone made a successful landing but broke a few spars, which were repaired on the following day.

SHRIVER HAD BAD SMASH.

WILMINGTON, Del., Oct. 4-7.—Tod Shriver and J. J. Frisbie filled this date. Frisbie made only some short flights. "Slim" Shriver made a magnificent flight on the 3d, over part of the town, and was up 15 minutes in a strong wind. He landed with the wind behind him, did not shut off the motor in time, he hit the ground, bounced, then landed nose on and the machine rolled over. He crawled out and the first thing he asked was, "Can you fix it up for to-morrow?" The doctor found a bone broken in his leg.

The machine is one built by himself, and is called the "Shriver-Dietz"; it is of the usual Curtiss type, but fitted with a 30-50 Kirkham motor of a weight of 288 pounds. Bosch high tension magneto, Livingston radiator, Shebler carbureter, propeller 6 ft. 6 in. by 3½ ft. pitch, which gives up to 340 pounds standing push at 1,360 r. p. m.

BIRMINGHAM, Ala., Oct. 6-12.—P. O. Parmelee, a Wright aviator gave an exhibition at the Alabama State Fair. The first day a flight was made in a drizzling rain; the second day there was no attempt at flying made on account of the wind being high.

KANSAS CITY, Mo., Oct. 7-8.—Capt. T. S. Baldwin and William Evans flew at Elm Ridge Park. One of the contests was a race between the two machines for $500, offered by the Kansas City *Post*.

Evans is a new-comer who recently bought a biplane from Dr. Wm. Greene of Rochester. He sprang into prominence by his sensational flights at Overland Park in his first trials, with a 40 h. p. Elbridge engine. His longest flight was one of about 28 miles across country.

William Evans of Kansas City

THE STRONGEST LIGHT METAL

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Specific Gravity 3.20

Tension, - 44,000 lbs. to sq. in. Compression, 126,000 lbs. to sq. in.
Transverse, 87,000 " " " " Torsion, - 60,000 " " " "

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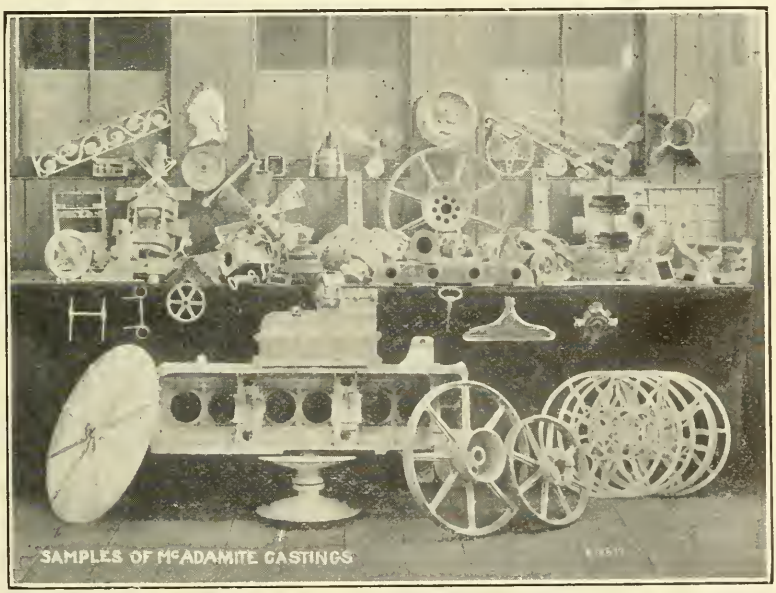

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Aeronautic Motor Engineering

Recently an ad. appeared in an English technical paper calling for four engineers and offering the sum of £1000 each for their yearly services. This firm building motor cars felt that this expenditure was an investment well made in its endeavor to produce the best results. Now, you cannot afford such an expensive organization, much less maintain it. We offer you the services of such men and at a price that is within your reach.

Our specialty for fourteen years has been the design of light weight internal combustion engines. We design in accordance with your ideas, but, we also design to specified conditions. If you have drawn up your ideas can we not engineer them, and place the material to resist the stresses that are imposed? We determine these stresses for you, suggest improvements or economical manufacture. We guarantee results. We conduct tests on the strength of materials, calculate the strength of structures, and make mechanical drawings.

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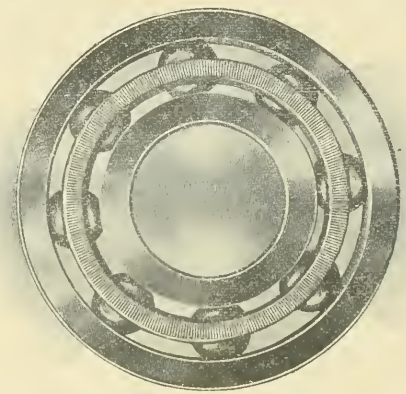

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All Sizes Hoffmann Steel Balls on Hand.

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ST. LOUIS, Mo., Oct. 8-18.—Five Wright machines are flying daily at the meet of the St. Louis Aero Club, held in connection with the international balloon race on the 17th.

Ely filled the Roanoke, Va., date, Sept. 21-22. At Poughkeepsie, N. Y., Sept. 27-30. Ely raced an automobile and made good flights before the biggest crowd the fair has ever seen. Willard flew at Riverside, Mass., Sept. 28. George F. Russell exhibited at the Danbury, Conn., fair, Oct. 5. Mars was at Spokane, Wash., Oct. 3-8, and Ely at Youngstown, O., on Oct. 12.

Arch Hoxsey (Wright) flew at Rochester, N. H., Sept. 27-30.

Thousands attending the Washington (Pa.) centennial celebration, Oct. 3-7, stood speechless when Brookins made his high and sensational flights. About 1,000 feet up, in one of his flights, the machine was caught by a gust of wind. It dipped and plunged downward about 100 feet before it was righted. The aviator later landed safely.

HOXSEY AND BROOKINS SET NEW MARKS

BROOKINS MAKES NEW AMERICAN RECORDS.

175¾ Miles Across Country.

Total straight line distance from town to town	175¾ miles
Total flying time	5 h. 51 m.
Average speed per hour	30.4 miles
Elapsed time, start to finish	7h. 12 m.
Left Wash. Park, Chicago	9:15 a. m.
Arrived Gilman, Ill., 75¼ m.	11.43 a.m.
Left Gilman, Ill.	12:41 a. m.
Arrived Mt. Pulaski, Ill., 86½ m.	3:20 p. m.
Left Mt. Pulaski, Ill	3:43 p. m.
Arrived Fair Grounds, Springfield, Ill., 23¾ miles	4.27 p. m.

Springfield, Ill., Sept. 29.—By going 86½ miles without alighting, Walter Brookins, in his Wright biplane (minus front control), broke the American record for cross-country flying, made by Charles K. Hamilton, who set the mark of 74.31 miles in the flight from New York to Philadelphia and back. Curtiss' longest cross-country flight was 71.25 miles, in his Albany-New York trip.

The aviator flew for the most part at an elevation of 800 to 1,000 feet, but occasionally dropped lower or mounted higher to fly in better air currents. The average wind for the 5 hours was 9½ miles an hour, head on.

BROOKINS MAKES TWO NEW RECORDS.

Not only did he make more miles in one stage of the trip, but the total distance flown is greater than either that made by Curtiss or Hamilton. The latter's flight to Philadelphia from New York, and return, totaled 149.54 miles, and Curtiss on his Albany-New York flight covered 142.5 miles.

The flight was made under the auspices of the Chicago *Record-Herald*, which offered a purse of $10,000.

The start was in Washington Park, Chicago. It had been arranged for Brookins to land at Gilman to replenish his oil and gasoline supply. Brookins waited at Gilman for 45 minutes before the accompanying train came in. Train started from Park Row Station, Chicago, at 10:02. A special car was attached, which was held when necessary.

An oil pump which didn't work caused a landing at Mt. Pulaski. This was repaired after a few minutes and the flight resumed. In starting, one of the wheels was wrenched off, but Brookins did not know it and kept on going. From here he left the line of the railroad and headed directly for the capital of Illinois. After circling above the Fair Grounds at a height of 2,000 feet, he shut off the motor and glided down, the deed planned successfully accomplished.

Wilbur Wright and the newspaper men followed the flier in a special car attached to a passenger train of the Illinois Central. This had to make its regular stops, which gave Brookins time to beat the train to both Gilman and Mt. Pulaski.

For the distances AERONAUTICS is indebted to Mr. Williams Welch, Chief Draughtsman of the Office of the Chief Signal Officer, U. S. Army.

AVIATOR HOXSEY MAKES NEW RECORD.

Flew 91 Miles from Springfield to St. Louis.

ST. LOUIS, Oct. 8.—Arch Hoxsey, in a Wright biplane, flew from Springfield, Ill., to the Country Club grounds at Clayton, St. Louis county, to-day and established an American sustained flight record in an aeroplane by covering [illegible] miles in an air line. His time for the 86 miles was 2 hrs. 45 min., an average of [illegible] m. p. h.

His objective landing place was the aviation field at Kinloch Park, but because of his failing to find the grounds he descended eight miles away. He alighted on the aviation field at 3.30 P. M. His time in the air was 3 hours.

Hoxsey tried to find the field, and circled within three miles of it five times. His engine could be heard when he was not in sight. He mistook the smoke of a brick plant for the tar fire on the field, and could not locate the field.

He was seen from the aviation field at 2.14. Soon as Walter Brookins could get an aeroplane started he went aloft to guide his fellow birdman to the field, but Hoxsey veered to the south and was lost to view. Bombs were exploded and the band played as loudly as possible, but the aviator did not hear the guiding noises.

He landed at the country Club, five miles from the field, at 3.11. After he had learned the direction of the aviation field he went into the air again and landed safely.

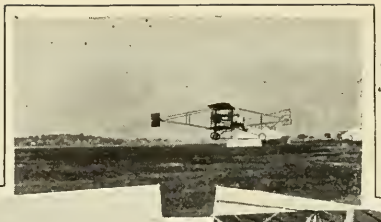
The flight was the opening event of a ten days' meet under the auspices of the Aero Club of St. Louis.

Brookins, Turpin and Welsh entertained the spectators with flights while waiting the arrival of Hoxsey.

Roosevelt Up.

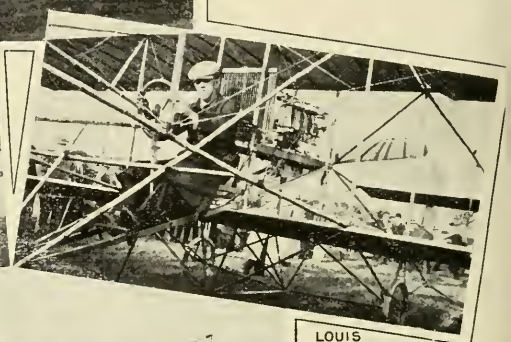
During the St. Louis meet, with the Wright machines of Hoxsey, Turpin, Parmelee, Welsh, Ogilvie, Brookins and Johnstone, and Leblanc with his Bleriot, Hoxsey took up ex-President Roosevelt for a short flight.

FLIGHT PROGRESS OVER THE COUNTRY



J.H. SMIDLEY MONOPLANE WHICH FLEW IN WASHINGTON WITH 2 CYL. STEVENS DURYEA AIR COOLED 18 H.P. MOTOR.

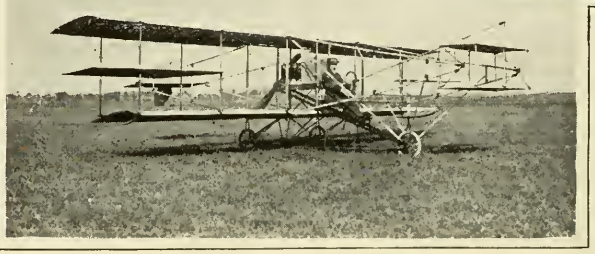
AUGUSTUS POST IN HIS "CURTISS".



LOUIS ERICKSON AT STURBRIDGE FAIR.

HENRY C. COOKE'S CURTISS TYPE AT MINEOLA.

PHOTO BY JOS BURT MINEOLA, N.Y.



THE Stebbins-Geynet Aeroplane Co., of Norwich, Conn., are building aeroplanes of the triplane type, which have a detachable middle plane, thereby changing from the triplane to the biplane type when desired. They are different from all other American aeroplanes now on the market, as they involve the use of three main planes—two combination front horizontal rudders and two combination rear horizontal rudders. They are beautiful in appearance and of simple construction. All joints are firmly held in place by castings of a special aluminum alloy, being strongly built and having a number of novel and original features, several of which are especially praiseworthy. Although this machine only has a twenty-four foot spread and only twenty-six feet long over all, its total amount of supporting area is 400 sq. ft.; weight 600 pounds in flying order, and have a lifting capacity of approximately 700 pounds more.

Frame.—Entirely of a selected grade of Oregon Spruce, finished down to a smooth surface and varnished. All struts are fish shape and set in aluminum sockets which are bolted to top and lower beams with special strong bolts of small diameter. The middle plane is set inside of the six uprights and held in place by aluminum castings. A flexible twisted 7-strand wire cable and Stebbins-Geynet turnbuckles are used for trussing.

Planes.—Top plane is three sections, laced together, having a 24 ft. spread and 7 ft. depth; middle plane in two sections, each of 7½ ft. in length by 6 ft. deep, and set 5 ft. apart for engine; bottom plane in one piece, 16 ft. long, and a depth of 5 ft.; a total supporting area of 350 sq. ft. These planes are set 3½ ft. apart and are set at angles of 9 degrees and so arranged as to have the greater amount of lifting area above and the greatest weight below the center of gravity. The middle plane is detachable, thereby changing from the triplane to biplane type when desired.

Construction.—Ribs are laminated of two pieces of spruce finished down to ½ x ¾ in. cross section dimensions with true curvature of about 1 in 20, and fastened to the beams by a special aluminum casting. No. 2 Naiad aeroplane covering is used in covering the plane and pockets are sewed in for the ribs.

Rudders.—Two combination elevating rudders are set well up in front, each containing 18 sq. ft of supporting area and arranged to work in unison, independently, or in opposite directions. In Model "B" machine are also two rear small elevating rudders which work in unison with the front rudders. One vertical rudder of 10 sq. ft. is suspended rear of a small stationary horizontal plane in Model "A," while a small vertical rudder of only 6 sq. ft. is hung beneath the small stationary plane in Model "B." The elevating rudders are so arranged as to balance the machine while in flight. Wing tips are also used in balancing. Rudder beams are held in place by a special two-piece casting which forms a hinge, thereby making a quick detachable joint.

Mounting.—The Curtiss type chassis is used for mounting with three Weaver 20-in. wheels and Hartford "*Aviator*" tires. Rear wheel gauge is 60 inches and 15 ft. wheel base. In Model "B" a spring skid is arranged below the main skid in such a way as to automatically drop when aeroplane leaves the ground and absorbs all shock when landing.

Power Plant.—Model "A" is fitted with Cameron 25-30 h. p. four cylinder air cooled motor with a 3⅞-in. bore and 3¾-in. stroke, with Bosch high tension magneto and Rinek Aero Co. propellor, giving very good results. A Model "C" Holmes rotary 7-cylinder motor, which is similar in design to the famous Gnome Motor, is being installed in Model "B." This motor has a 4 x 4 in. bore and stroke, and will drive a Stebbins-Geynet 7 ft. in diameter, 6 ft. pitch, propeller at 1,200 rev. per minute, and a thrust of 350 pounds is expected to be obtained.

Control.—A very simple and positive control is employed, known as the Stebbins-Geynet "auto" control; a pull or push movement operates the elevating rudders, while the balancing is done

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WILL FLY AT THE

International --Aviation-- Tournament

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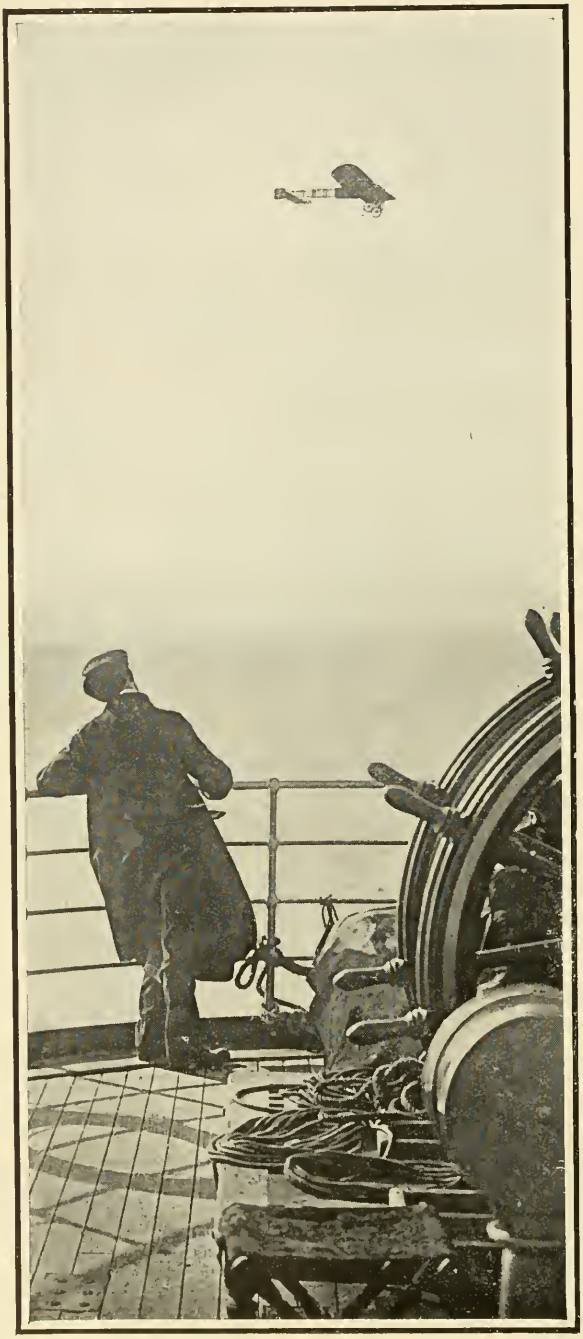
Alfred Leblanc	Alec Ogilvie
Emilie Aubrun	Chas. K. Hamilton
Hubert Latham	Walter Brookins
Count de Lesseps	John B. Moissant
Rene Simon	J. Armstrong Drexel
Claude Graham-White	Clifford B. Harmon
James Radley	Thomas S. Baldwin

Special Train Service from the Pennsylvania Terminal. Boxes, Parking Spaces, and Reserved Seats can be obtained at the Tournament Headquarters, Room 1105, Fifth Avenue Building, or at Tyson's, McBride's, or any of the leading ticket offices.

Have You Seen The Man-birds Fly at Belmont Park?



COUNT DE LESSEPS CROSSING THE CHANNEL IN HIS BLERIOT

Does not the graceful, sure, and steady flight of the monoplanes inspire you with confidence and a desire to fly yourself in one of these machines?

Since Bleriot flew the English channel over 400 people have taken up the use of his machine. It holds the records for speed, endurance, and high flying; its greatest performance being the flight of George Chavez across the Alps. Moissant flew from Paris to London with a passenger, after having made but three flights previously in one of these machines.

The Beach Monoplane

is of the Bleriot No. 11 (cross-channel type). It is fitted with a powerful gyroscope which prevents side-tipping and gives it far greater automatic stability than is obtained with any other aeroplane. As a result you can fly in high winds without danger of upsetting and without fatigue from maintaining your equilibrium in the usual way by hand.

We can supply the Beach Monoplane in two types and sizes. The prices of these are $5,000 and $7,500 respectively.

Catalogue and full particulars upon request.

SCIENTIFIC AEROPLANE CO.

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New York

The Scientific American Trophy

Was the *first* aviation trophy offered in this country (1907). The contest for this cup will be one of the features of the International Aviation Meet at Belmont Park, Oct. 22d to 30th. The winner this year will be the aviator making the longest cross-country flight. Glenn H. Curtiss won the trophy in 1908 and 1909, and unless his Albany-to-New York flight is surpassed during 1910, he will become its permanent owner.

The Scientific American Aeroplane Trophy

Another feature of the Meet will be

THE AVIATION NUMBER

OF

The Scientific American

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¶ The contents will include *popular* and *elementary* articles on aviation, written so that the average man and woman can understand and enjoy every word.

¶ There will be articles on the difficult art of learning how to fly; how aeroplanes are balanced; a series of carefully prepared drawings of the leading types of machines, every part painstakingly labeled, so that the mystery of the machine's construction is revealed at a glance; dozens of pictures of machines on the ground and in the air; and a brief history of mechanical flight, in which credit is given where credit is due for the most wonderful achievement of our time. These are but a few of the more important articles.

¶ Be *sure* to read this epoch-marking number of the Scientific American. Tell your newsdealer to reserve a copy for you—or, better, send us $3.00 and receive the Scientific American 14 months for the price of one year's subscription.

If you are a home owner, you will also be interested in our beautiful monthly "American Homes and Gardens" which we will include in the above offer for $2.00 extra. By sending $5.00 you will obtain $7.00 worth of subscriptions, and receive both publications regularly for the next 14 months.

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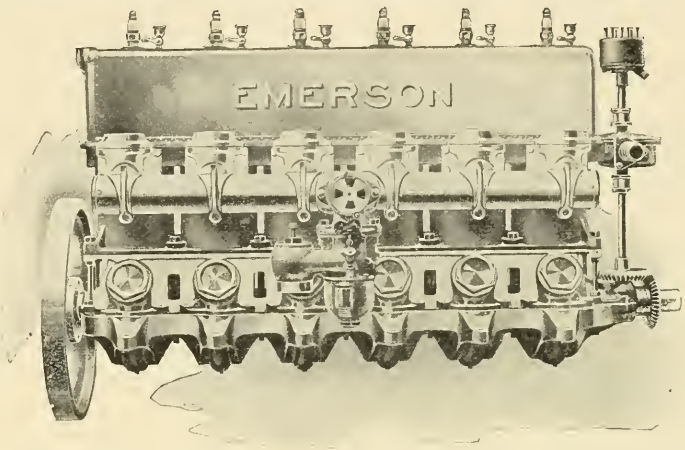

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24 x 3" and 26 x 3" French Type Aeroplane Tires to fit Farman, Bleriot, Antoinette, Voisin, Sommer and Roe machines equipped with French and English Rims.

20 x 3" Single Tube Tires to fit American Type Crescent Rims. Rubber coated moisture-proof fabrics as used on practically all foreign machines and now being adopted on American Aeroplanes. Weights from $2\frac{1}{2}$ to $4\frac{3}{4}$ oz. per square yard.

Rubber Aeroplane Springs for absorbing alighting shocks, Farman Type.

Rubber coated balloon fabrics as used on all German, French and English Government balloons.

Our line of Aeroplane and Balloon materials is the result of careful investigation into American and European requirements and standards.

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Akron, Ohio

with side movement or slight turn. The rear vertical rudder is operated with a foot control. Engine control levers are conveniently placed within reach of the left hand and foot brake on the front wheel. An arrangement is to be tried out, whereby the front wheel will be connected with the steering device in much the same manner, as a bicycle is steered on the ground.

Hugh Willoughby's First Flights.

Hugh L. Willoughby has made his first flights with the "War Hawk," at Atlantic City Beach. The flights were under 100 yards and less than 10 ft. altitude, but the machine got in the air at a speed of only 20 miles an hour, running over a track made of smooth boards about 150 ft. in length. Mr. Willoughby found the steering easy and natural, and a little drop of the starboard wing was corrected with a Curtiss shoulder control. The patented control of the engine, with right foot pedal, described in AERONAUTICS last year, worked to perfection.

The front and rear horizontal rudders worked in conjunction with each other as in the Farman machine and some of the Wright aeroplanes. The landing wheels are arranged similar to the Farman. The total weight of the "War Hawk" is 1,019 pounds. The 30 h. p. engine is a stock automobile engine, made by the Pennsylvania Automobile Co., and weighs 430 pounds. Mr. Willoughby is now at work on another machine, which he calls the "Pelican," at Clementon, N. J. On the 15th of November Mr. Willoughby will leave with his machine for his winter home at Sewalls Point, Florida.

Novice Flies First at Exhibition.

George Schmitt, of 5 Royce St., Rutland, Vt., had a contract to fly and had never been in an aeroplane. The payment was contingent upon his actually flying. He did not get the machine ready in time to make any trial flights at all. He never knew even how to start the Elbridge engine, as he did not receive it until a day or two before the date of exhibition. He got his machine assembled at the exhibition grounds and just flew, and got paid. He bought the parts for the aeroplane from Witteman Brothers and assembled them himself.

Flights in Kansas and Missouri.

O. A. Mattingly, of Pittsburg, Kansas, has been making daily flights with his biplane on the prairies west of Pittsburg. Mr. Mattingly damaged his machine somewhat recently, but repaired it and has become so proficient that he has agreed to fly at the Ozark Four-State Exposition, at Joplin, Oct. 8-17.

He says he intends to get thoroughly familiar with the "game," and then try for the St. Louis to New York prize.

His machine has an original device of his own for lateral balancing. The machine and motor were built by the Holbrook Aero Supply Co., of Joplin.

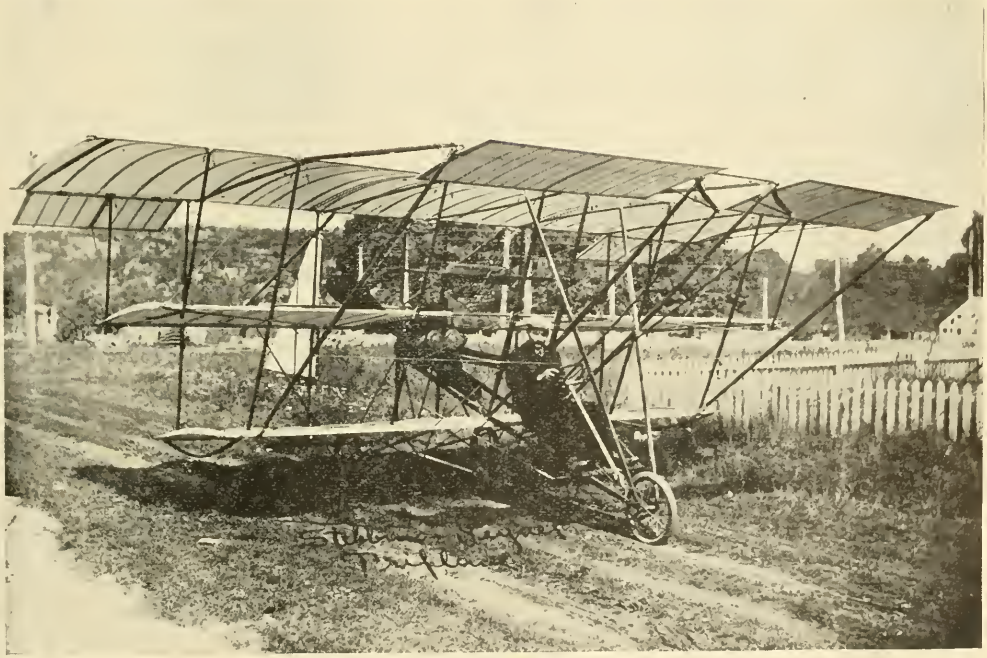
The De Chene-Sowers all-aluminum biplane, which is a Curtiss type in the main, with many original features, is making repeated flights at Joplin, and the makers are preparing to get before the public with it.

New York's Biggest Aeroplane Factory.

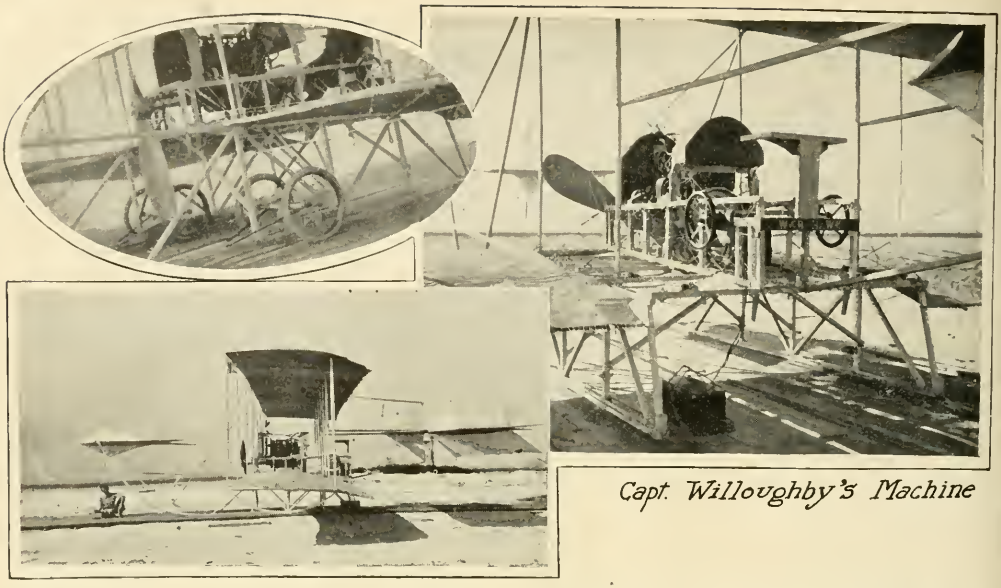
That New York and vicinity has several plants for the making of aeroplanes is not so very generally known, but the searcher for a machine can discover shops tucked away in lofts, in automobile garages and buildings which have sometime served a more earthy purpose.

No one has seemed to pay much attention to the rumor that Capt. T. T. Lovelace, filibuster, "admiral" of a South American one-boat navy, airship pilot, yachtsman, alligator hunter, showman, aviator and balloonist, a "soldier of fortune," had joined with Fred. Thompson, who built Luna Park, the Hippodrome and has for some years been interested in the Fort George amusement park, in the building of aeroplanes on a big scale.

On a high cliff overlooking the Harlem river and Spuyten Duyvil Creek, where Curtiss landed on his Albany-New York flight, is a huge dancing pavilion with a half dozen monoplanes in all stages of construction on its floor. The band's platform is now taken up with a work bench and tools. One of these monoplanes is for Leo Stevens. Another building, measuring 150 feet in



Stebbins and Geynet Triplane



Capt. Willoughby's Machine

length, has a line of shafting its entire distance, running planers, saws and all sorts of woodworking machinery. In still another building is a big lathe, drill presses, forges and other machine tools. Even a casting shop is being arranged. All the machines are run by electric motors. Off the big dancing room are other rooms with draughting boards, work benches and an office.

The buildings, for years allowed to go to rot and ruin, are being patched up and the roofs covered with tin; storm-washed walks are being rebuilt and trees cleared off the grounds to make this historic spot a commonplace factory for the making of flyers.

Captain Lovelace was in charge of the last show the Aero Club of America had. Then he was at the Jamestown Exposition in the aeronautical department. From there he took an airship to Panama, which enterprise did not end in any ascents, owing to impossibility of making the gas there. He was next heard of in London when his airship took fire at an exposition, and a young lady assistant was burned to death. After being with Wilbur Wright at Le Mans and Rome, he was manager of the aerial department of the Humber Company in England. His first public appearance in flight was at the Doncaster meet.

Stevens Buys Aeroplane.

Aeronaut Leo Stevens, who has been sailing and building balloons for many years, has bought an aeroplane—two of 'em.

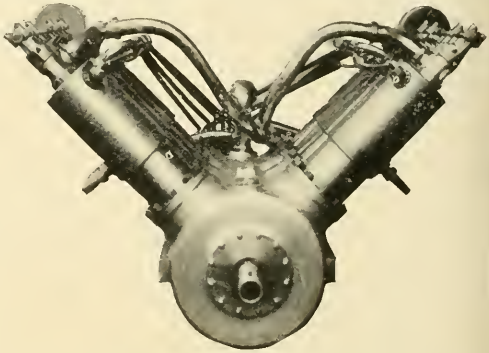
That does not mean at all that ballooning is decadent, but that the aeronaut wants merely a new sensation. Ballooning will always hold its own. In this country the sport has increased in popularity instead of declining.

Stevens has been considering the making of aeroplanes and has looked over the field and has now bought a 35 horse power monoplane built by the Lovelace-Thompson aeroplane and motor works.

Hamilton Has Speed Marvel.

On the 9th of October, Chas. K. Hamilton began flying again after his accident at Pasadena. Without preliminary runs of the 110 h. p. Christie engine, he started from the Aeronautical Society's shed and shot in the air almost instantly. William Wurster, of the W. C. P. Co., swears his speed was 100 miles an hour. He says he timed him over the course, said to be 1¼ miles, but never officially measured, even by America's latest controlling organization, the National Council, in 39 seconds. This figures out at 116 miles. Perhaps Brother Wurster was wrong, but, at any rate, everyone says he has more speed than any record yet, which means 70 miles an hour.

The machine is a straight Curtiss type, but built extra heavy, reinforced all through and guyed with big wires. New light Goodyear tires and rims have been put on.



The Hamilton Engine.

The Hamilton engine was designed by Walter Christie, who says there has been some misprint in regard to it. The bore is 4⅜ x 7 in. stroke. A. L. A. M. rating makes this 61 horse power. The makers rate the engine at 110 horse power at 1,500 r. p. m. In view of the length of the stroke this would seem to be a conservative estimate.

Coddington & Webb (Mangum Webb and C. C. Coddington) has leased a five-acre tract on Providence road, Charlotte, N. C., and will establish an experimental station for manufacturing aeroplanes. A contractor of Charlotte is proceeding with construction of timber building 150x40 and 40x40 feet in size; the company will also conduct an aeroplane school.

Dr. William Greene has made his first flight with his new cross-country aeroplane at Rochester.

O. Chanute Ill in New York.

Octave Chanute arrived in New York on October 8th, and is seriously ill with pneumonia. He has the best wishes for his speedy recovery from thousands of people who are acquainted with him personally, or otherwise, through his work in aeronautics.

The Name

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¶ Our Model *A* flew successfully but our Model *B* beats it.

¶ Our new Model *C* is even better.

¶ The price remains the same.

Call any Day—Weather Permitting at our Aviation Grounds, Newburyport, Mass.

For a Convincing Demonstration

Imported Aviation Motors

¶ A limited number of the well known Clement-Bayard Aviation Motors, delivering 30 horse-power and weighing 108 pounds, may be purchased from the Burgess Company and Curtis, Marblehead, Mass.

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At Money Saving Prices

NICKLE PLATED TURNBUCKLES, Very Light and Strong, each, 12c.

Elbridge Special Feather-weight, 2-Cycle Aero Motors (water cooled):
3 Cylinder, 30-45 H. P., 138 1-2 lbs. . $750.00
4 Cylinder, 40-60 H. P., 178 lbs. . . . 1050.00
Cylinders 4 5-8 x 4 1-2, copper jackets, aluminum bases, hollow crank shaft.

20 x 2 Aeroplane Wheels with tires built with steel rims and special hub, very strong, price, . . 11.75

E. J. W. Aeroplane Hubs turned from solid bar of steel, drilled 36 holes, well-nickeled, . . . 4.00

E. J. Willis Propellers, laminated wood, perfect screw:
6 ft., 6 1-2 lbs. 40.00
7 ft., 9 lbs. $50.00
8 ft., 12 lbs. 60.00
The 6 ft. propeller gives 200 lbs. thrust at 1200 R. P. M.

Model Propellers, laminated wood, 10 in. to 12 in. perfect screw, ... 4.00

Galvanized Steel Cable for "Guying":
1-32 in., 200 breaking strength, price per ft. .03
1-16 in., 500 breaking strength, price per ft. .03½
3-32 in., 800 breaking strength, price per ft. .04
1-8 in., 2300 breaking strength, price per ft. .06

Rubber Bands for models, 12 ft. lengths, 1-8 in. square, each, ... 1.00

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We have on hand:

All parts for Curtiss Biplane as per specification in September issue of "Aeronautics"

Loose Monoplanes, ready for motor ***$350.*** crating for shipment extra. Immediate delivery.

Greene Biplane, with 8 cylinder Curtiss motor, ***$2500.*** Fine flyer, shipping cases included, guaranteed in excellent condition. Immediate delivery.

Farman Type Biplane, with Elbridge 40-60 motor, will give 5 mile flight. ***$4500*** including packing cases and extra propeller. Immediate delivery.

Aero Wheels from ***$4.50*** up.

"Camasco" Unbreakable Wheels, *$6.25.*

40 H. P. Curtiss, *$650,* 8 cyl.

20 H. P. Curtiss, ——— 4 cyl.

60 H. P. Hall-Scott, motor in good condition, has flown a 970 lb. machine, ***$1450.***

"Camasco" Knockdown Planes from ***$150*** up.

Distributors of the "Parabolel Propeller"
Agents:—Detroit Aeroplane Co. Motors, Detroit "Rotaero," Palmer and Goodyear Tires, Naiad Cloth.
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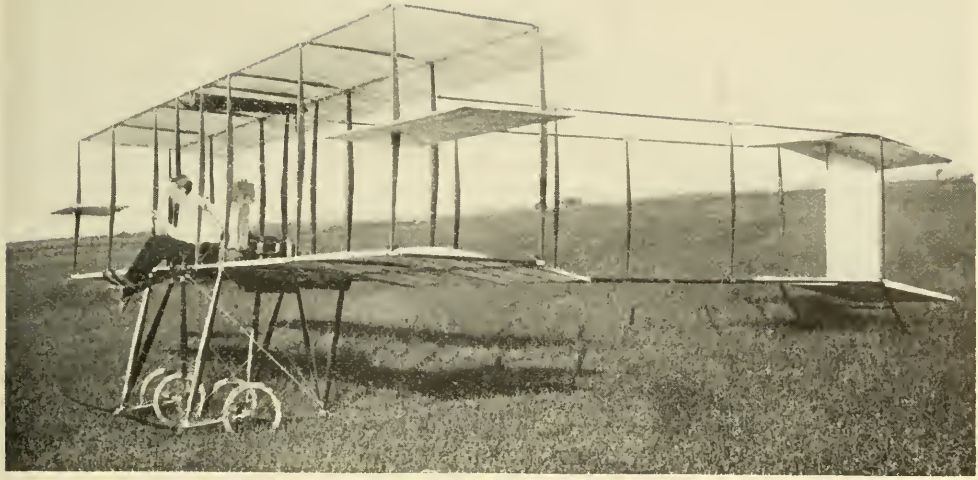


Headless Biplane of H. W. Gill

Vermont Man Builds Curtiss Type.

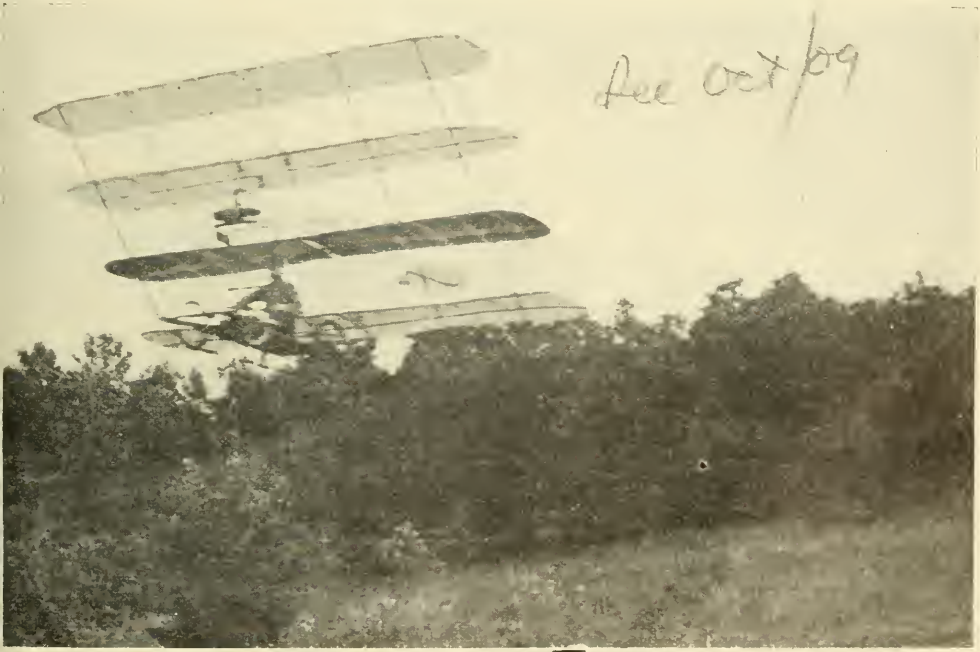
C. C. Bonette, of Passumpsic, Vt., has built a Curtiss type biplane from the information given in AERONAUTICS, and is using the machine for exhibition purposes.

FROM PARACHUTE TO AEROPLANE.

In talking with a representative of AERONAUTICS, Mr. Bonette said: "I have been in the hot air balloon line for the past 18 years, with parachute work. I originated some very good features in this line, including parachute from parachute act, which I did for the first time at Plattsburg, N. Y., in 1903. I had the aeroplane idea soon as the Wrights made flights, and decided to either buy or build one for exhibition purposes, as I could see that it was the coming attraction. I got prices on machines, and could see where I could save a big amount by building my own machine, which I did. I don't believe any machine was ever built under more difficulties, than mine. After nine months of hard work, and lots of remodeling up to two weeks ago, I got a flier.

"My machine is a Curtiss type, leaves the ground nicely, and is a bird in the air. I have an Elbridge 40 h. p. engine that is proving very satisfactory. I have a good offer for the winter with my machine and I want one engine man, and one experienced aviator: can you help me to find the two men? I want these men for six months, and by that time I hope to be able to drive my machine. Will you kindly send me the addresses of one or two good men?

"I use the Requa-Gibson 7 ft. by 4 ft. propeller. I consider these are the best propellers in the market."



M. B. Sellers in Flight with 10 h. p. [rated] Motor

M. B. Sellers May Fly in New York.

M. B. Sellers, of Grahn, Ky., who has been doing such wonderful work in his flights with but a little over four horse power, has equipped his latest machine with wheels for starting. These rise automatically when the machine leaves the ground and allow the aeroplane to alight on the runners. Mr. Sellers' use of this actually antedates the published accounts of the Farman and Antoinette flights, being used in a model in June, 1908. The use of the weight, as described heretofore fully in AERONAUTICS, has been done away with. Successful flights are now being made with a Bates 2-cylinder opposed rated 10 h. p. motor.

Mr. Sellers hopes to come to Mineola soon and show New Yorkers what can be done with a little bit of power. His work has been not to just fly—as almost any machine can do that—but to develop the efficiency of surfaces and a propeller to a point where successful flight may be obtained with the minimum of power.

Women Learn to Fly.

Miss Blanche Scott, the young lady who drove an automobile across the continent, began her trials at flight with a Curtiss machine at Hammondsport on Sept. 26. After a few flights by Glenn Curtiss himself. Miss Scott was allowed to do some "grass cutting" to get accustomed to the controls. After an hour of this she made a couple of short straightaway flights. The rest of that week was a repetition of the lessons, with grass cutting and flights alternating.

Mrs. F. Raiche, whose husband has endeavored to establish an aeroplane manufacturing business at Mineola, has made a number of successful flights with a Curtiss type machine fitted with a Fox "De Luxe" motor. Previous attempts at flights had been made by Raiche but his home-made engine either fell to pieces or did not work. Then he got the Dean engine and the "Missus" tried the machine and it flew "to the Queen's taste." Of course Mrs. Raiche had to break a rib or so in the machine but all aviators of note do that. America can now boast of two female aeroplane pilots.

Mrs. Raiche has been presented, by admiring friends, with a handsome jeweled medal in recognition of her achievements.

Orville Wright's Flights Over Dayton.

On Sept. 22, during the Dayton Fall Festival, Orville Wright flew from the training grounds at Simms Station over the city of Dayton and back, making a most spectacular flight. The distance was about 18 miles. As this was the first flight ever made over the city, the wildest enthusiasm reigned, all business being suspended for the time. The flight was made absolutely on schedule time and was, of course, a perfect one in every respect, great height being maintained during the entire flight. Mayor Burkhardt was a passenger on one flight.

Novel Features in Illinois Aeroplane.

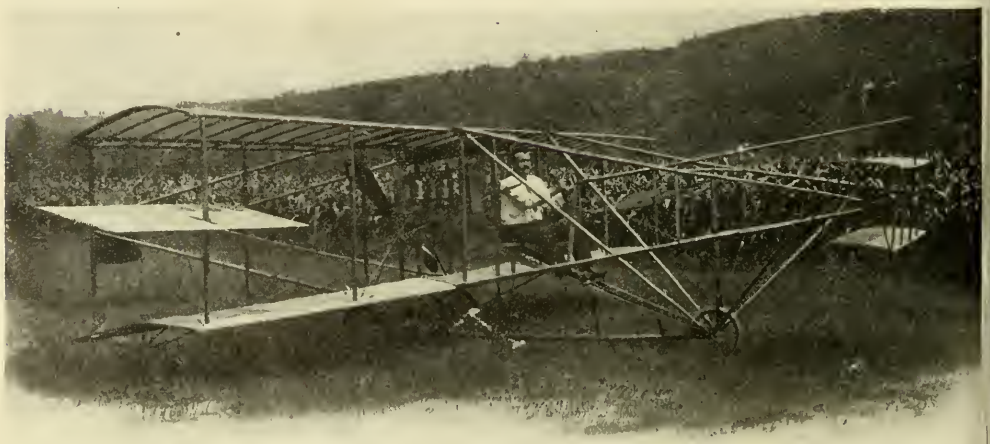
William E. Somerville, of Coal City, Ill., states he has made flights with the novel machine illustrated herewith. The total area is 510 sq. ft., and the machine weighs 1,020 pounds. The upper main plane is 45 x 5 ft., the lower 35 x 5 ft. The tail, 8 x 5 ft., is placed 18 ft. back of the trailing edge. The elevator, 3 x 10 ft., is 10 ft. ahead of the leading edge. The engine has four cylinders, 4 cycle, 5 x 5 in., developing 40 h. p. at 1,000 r. p. m., propeller 7 ft. in diameter by 5 ft. pitch. Angle of incidence 5 degrees when in the air, on the ground 9 degrees. It will be seen from the photographs that the top ends of the main planes are upturned, also that a central fin is placed on the top plane.

The inventor states that he has found the upturned ends of the wings and central fin to be sufficient to maintain lateral stability. He states: "In calm weather I had no use for the Venetian blind arrangement situated near the extremities of top plane, but with a breeze the machine rocks occasionally and I had occasion to open the blind on the high side, and the machine immediately regained an even keel. I am positive as soon as I get accustomed to being in the air that the blinds will not be used, as the upturned ends and controlling fin are all that are required to maintain lateral stability automatically. The longitudinal stability is maintained by the peculiar construction of the tail. The top plane is perfectly flat; the bottom is slightly curved. I had some trouble getting the proper angle of incidence on the tail, but after a few trials the machine flew nicely without oscillation."

A monoplane has also been designed and built with upturned ends and central fin but not yet tried out.

Eldridge Tries Parachute.

Dr. Thos. E. Eldridge, of Philadelphia, recently went up in a hot air balloon at the Trenton State Fair, and returned to earth via parachute. That's a stunt few will follow.



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The ONE American Built MOTOR

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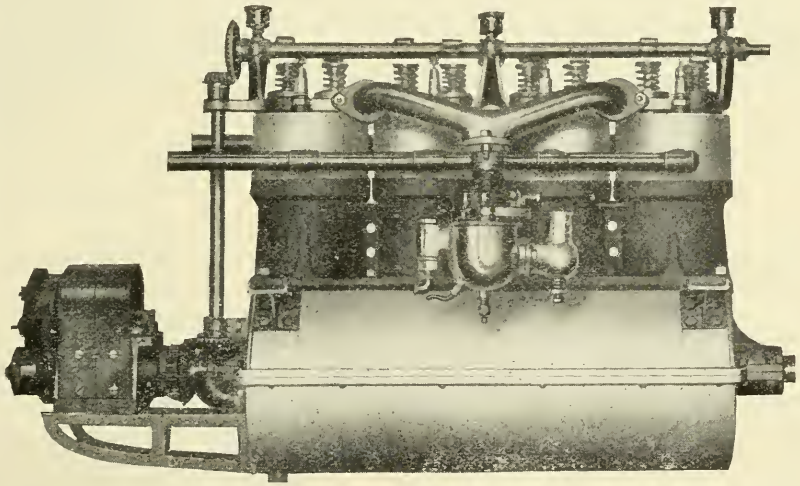
A NEW and distinct type—different from all others. Practically vibrationless; has fewer working parts, occupies less space; develops more actual H. P. and speed and runs longer on a gallon of gasoline than any other engine made. Cost less originally, is most economical to operate, most efficient, most durable and absolutely dependable under all conditions.



30—35 H.P.
4 cyl. 4 cycle
Water-cooled
110 lbs. Complete

"The Quality goes in before the Name goes on"

60—70 H.P.
8 cyl. V 4 cycle
Water-cooled
175 lbs. Complete

Descriptive matter upon request

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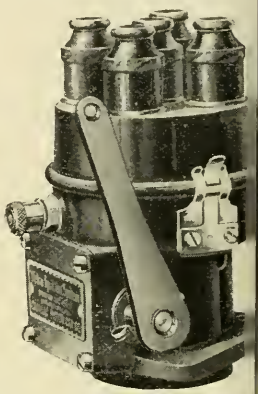
DELCO IGNITION

FOR AEROPLANE MOTORS

¶ Delco Battery Ignition runs with as little attention from the operator as the highest priced magneto. It is better for aeroplane work than a magneto because of greater range of effective spark control, because of greater speed, and because it makes your motor easier to start. ¶ Six ordinary dry cells are used as a source of current supply and will run your motor a very long period. They will run an automobile 2,000 miles or more. ¶ With a Delco equipped motor you never have to spin it to start. A slight turn is all that is required. ¶ No other ignition will give you as great engine speed as Delco. No other ignition is so simple or requires so little attention. ¶ Tell us the type of motor you have, and your present ignition equipment, and we will quote prices for equipment with Delco.



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with aluminum housing for Aeropl

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Delco Ignition Dept. DAYTON, OHIO, U. S. A.

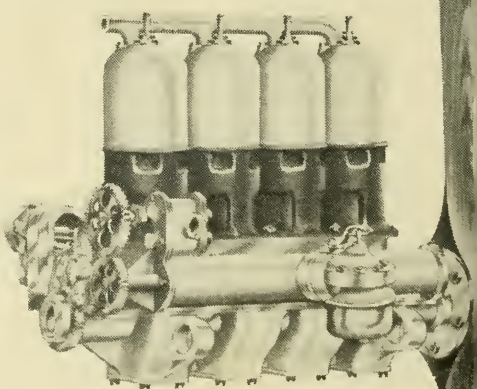
The Roberts Aeroplane Motor

4-CYLINDER 40-H.P. 165-POUNDS

Designed by E. W. Roberts, M. E., America's Leading Gas-Engine Expert, and formerly Chief Assistant and designer on Sir Hiram S. Maxim's aeroplane in England.

THE weight given includes everything shown, except the propeller. Propeller and radiator furnished with motor. This is a motor absolutely free from freak ideas and gives its rated H. P. at 1,000 r. p. m. The only two-cycle guaranteed free from base explosions. Long bearings, large crankshaft, Bosch magneto, free from vibration, and a motor that will run for any length of time without missing or overheating of bearings.

Write For Catalogue Today.



The ROBERTS MOTOR CO.
1430 Columbus Avenue - Sandusky, Ohio

Orville Wright Flying at Simms Station

Wm. E. Somerville
of Coal City, Ills.

THE INTERNATIONAL BALLOON RACE

LT. E. MESSNER.

COL. SCHAECK.

LT. VOGT.

ALFRED LE BLANC.

HAUPTMANN VON ABERCRON.

Lieut. Vogt

Lieut. Vogt is 26 years old. After his work at Strassbourg University he studied meteorology under Prof. Hergesceff. Entered German Army and promoted to rank of adjutant of mounted artillery. Won first position in three long distance balloon races.

Colonel Schaeck

Won 1908 Gordon Bennett for Switzerland and established a world's duration record of 72 hours.

Alfred Le Blanc

Represented France in the 1907 G-B balloon race at St. Louis and finished 2nd, landing at Herbertsville, N. J., a distance of 866 miles. For this trip he made a new duration record for the U. S. of 44 hrs. and 5 mins. He was second in the 1909 G-B race from Zurich. Won $20,000 prize in covering 486 miles across Country in 10 days.

Hauptmann Von Abercron

Hauptmann von Abercron is 40 years old and has been interested in aeronautics since 1899, is a dirigible pilot and captain in an infantry regiment. President of the Lower Rhine Aero Club, the largest in the world. Has made 160 balloon ascents. In 1906, he won prize of the Grand Duke of Baden. He has been in every Gordon Bennett balloon race and finished third in the 1907 race from St. Louis. In a 340 c. m. balloon he has crossed the Alps. Herr Blanckertz is his companion in the 1910 race. The latter is a manufacturer in Dusseldorf, 40 years old, has made many balloon trips and with Abercron as pilot won the King of Saxony's prize in an ascent of 1000 kilometers out of Dresden.

THERE are eight balloons in the fifth contest for the Gordon Bennett trophy, to be held at St. Louis, Oct. 17. Three foreign countries are entered, France, Germany and Switzerland.

Representing France are Alfred Leblanc and Jacques Faure. Germany has Hauptmann Von Abercron, Lieut. Vogt and Ing. Hans Gericke. Switzerland, which country had the cup last, has Colonel Schaeck and E. Messner.

There will be no representatives of Denmark in the race, although the Danish Club had entered a balloon. It seems, or at least it is so reported, that the titled pilot selected could find no one in America who was willing to pay all his expenses for the privilege of being aide.

Besides the trophy there is a cash prize of $5,000, also given by Bennett.

The cup and the $5,000 additional has been given each year, beginning in 1907, when Lieut. F. P. Lahm and Major Henry B. Hersey won the cup and prize on its first offering.

PAST G. B. RECORDS.

Paris, 1906—Lieut. F. P. Lahm, 410 miles.

St. Louis, 1907—Oscar Erbsloh (Germany), 872 miles.

Berlin, 1908—Col. Schaeck (Switzerland), 753 miles.

Zurich, 1909—E. W. Mix (America), 696 miles.

Hawley, Honeywell and Wade Win.

The Aero Club of America has given out the official figures of the elimination balloon race from Indianapolis on Sept. 17.

A. R. Hawley, H. E. Honeywell and J. H. Wade, Jr., will represent this country in the international race, starting from St. Louis on the 17th of October. The distances and duration of each of the competitors follows:

America II.—A. R. Hawley pilot, Augustus Post aide, landing at Warrenton, Fauquier County, Va., 453 miles; duration 44 hrs. 25 min. 30 sec.

Centennial—H. E. Honeywell pilot, W. Lambert aide, landing at Bush Valley, Indiana County, Pa., 379½ miles; duration 23 hrs. 36 min.

Buckeye—J. H. Wade, Jr., pilot, A. H. Morgan aide, landing at Sowers, Floyd County, Va., 371 miles; duration 37 hrs. 38 min.

The Aero Club of St. Louis

ANNOUNCES THE NATIONAL AERO SHOW

November 17th to 24th, 1910

MAMMOTH COLISEUM BLDG., ST. LOUIS, MO.

Complete Exhibition of Aeroplanes, Dirigibles, Sphericals, Parts, Supplies, Accessories and All Articles of a Kindred Nature

THE BUILDING contains over 38,000 sq. feet of floor space, this has been laid out to give the public 1-3 and the exhibitors 2-3. More than half the exhibition space has already been taken, but we wish to show our visitors the best variety possible—so we would appreciate and do solicit communications from all interested

ST. LOUIS NATIONAL AERO SHOW

Coliseum Building :: :: :: St. Louis, Mo.

GLENN CURTISS

In the flight from Albany to New York City had his bi-plane equipped with

PALMER AEROPLANE TIRES

Manufactured by

THE B. F. GOODRICH COMPANY - AKRON, OHIO

NOTICE

Church Aeroplane Co.

has moved to its

NEW FACTORY

123 Smith Street, Brooklyn, N. Y.

Up-to-date Facilities for Building

AEROPLANES, GLIDERS, FRAMES for DIRIGIBLES, PROPELLERS, and Accurately Proportioned MODELS

New Supply Catalog now ready with prices for Complete Aeroplanes, Dirigibles, Finished Spruce and Ash and all Accessories.

Paragon Propellers made by the American Propeller Co. of Washington, D.C., Now on Exhibition at the Church Aeroplane Co's factory, 123 Smith St., Bklyn. N.Y.

8 foot—400 to 500 lbs. thrust guaranteed at 1000 to 1100 R. P. M.

EDWIN HOPKINS PAUL DE KILDUCHEVSKY

THE

H.-DeK. MOTOR

60-80 Horsepower - $1200
Weight 160 lbs.

30-40 Horsepower - $1000
Weight 110 lbs.

The Ideal Motor for Aviation. Reliable, Perfectly Designed and Balanced. Durable, Powerful and Unequalled in Construction and Finish.

ABSOLUTE GUARANTEE
And any test you want under any conditions

YOUR MONEY BACK
If you are not thoroughly satisfied with the motor in every respect

DELIVERY IN FROM 3 TO 5 WEEKS

Special Offer: Ask for our special offer. It enables aviators to get the motor question settled right, with greatly reduced initial outlay.

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1535 Broadway, Cor. 45th St.

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J. H. Wade, Jr. and A. H. Morgan

Son of J. H. Wade, one of Cleveland's (Ohio) wealthiest residents, who presented Wade Park to the City of Cleveland. He is 27 years of age, and, with his brother, is interested in real estate there. Wade has always been in for anything new and is well liked in his city. What he has done in aeronautics has been purely for sport in every respect.

His aide, Mr. A. H. Morgan was a chum of his in school and they have lived together more or less during their entire life. Mr. Morgan is the president of the American Lithograph Co., and has always been keen on the sport of ballooning.

Their first trip was made as guests of A. Leo Stevens, about three years ago, in the balloon "All America" from Pittsfield, Mass., in company with three others. This ascent was made in a driving snow storm. The party landed that same evening at Canterbury, N. H., after covering a distance of 168 miles. They enjoyed the sport very much and immediately after had constructed a balloon called "Sky Pilot" in which they have made many creditable flights. They have taken into the air many Cleveland boys and have got the better class of the above city interested. On Oct. 4, 1909, they won third prize in the Centennial balloon races from St. Louis.

Million Population City—S. L. Von Phul pilot, J. M. O'Reilly aide, landing at Trafford, Westmoreland County, Pa., 343 miles; duration 21 hrs. 16 min.

Miss Sophia—W. F. Assman pilot, P. J. McCollough aide, landing at Macfarlan, Ritchie County, W. Va., 269½ miles; duration, 24 hrs. 8 min.

Phil. II.—A. T. Atherholt pilot, C. B. Graham aide, landing at Dexter, Meigs County, Ohio, 218 miles; duration, 18 hrs. 52 min.

New York—C. B. Harmon pilot, Thos. S. Baldwin aide, landing at Powellsville, Scioto County, Ohio, 198 miles; duration, 18 hrs. 4 min.

Hoosier II.—Charles Walsh pilot, Maj. Samuel Reber aide, landing at West Milton, Miami County, Ohio, 99 miles; duration, 7 hrs. 6 min.

— C. G. Fisher pilot, 44 Bunbury, Fr. W. of - Pittsburg Pa. @ 5:10 pm. following day.

The duration of the America II. is greater by 20 minutes than the American duration record of 44 hours and 5 minutes, established in 1907 in the Gordon Bennett from St. Louis, which was later broken by Harmon and Post, who made a new American duration record of 48 hours and 26 minutes.

The "America II." and the Buckeye, 80,000 cu. ft. capacity, were built by Leo Stevens of rubber fabric. The Centennial was built by the French-American Balloon Co., of which H. E. Honeywell is the head.

The "Centennial" is the same balloon which won second place in the St. Louis race of October 4, 1909, ten balloons being entered. In this race it scored 488 miles and was up 47 hours and 41 minutes, establishing for the moment a new American record.

The free-for-all balloon race was declared to be won by the "Drifter." A. B. Lambert, the official in charge, gave the decision to this balloon, as at the time of start none of the others were ready to leave. The cup, a diamond studded and handsomely engraved trophy, was given by the Indianapolis Motor Speedway. In addition to the cups offered, gold Speedway Medals will be given the pilots who finished second, third, fourth and fifth. The standing of the balloons in the free-for-all race follows:

Drifter—A. Holz pilot, G. R. Howard aide; landing at Littleton, Wetzel County, W. Va., 325 miles; duration, 21 hrs. 15 min.

University City—John Berry pilot, no aide; landing at McKeesport, Alleghany County, Pa., 350 miles; duration, 20 hrs. 30 min.

Topeka—E. S. Cole pilot, E. M. Jacobs aide; landing at Washington, Pa., 325 miles; duration, 20 hrs. 48 min.

Luzerne—L. E. Custer pilot, no aide; landing at Noblesville, Hamilton County, Ind., 23 miles; duration 2 hrs.

H. E. Honeywell

Balloon builder of St. Louis. Won second place in the elimination race on Sept. 17, and in the Centennial race in 1909, when he covered 488 miles and was up 47 hrs. 41 min., a record duration at the time. Won balloon race from Chicago, July 4, 1908, making 786 miles, with 86 miles of the American distance record. Won third place when aide to A. B. Lambert in Indianapolis race, June 5, 1909. On Nov. 18, 1908, with Lambert he made a long ascent to Tiger, Ga., 461 miles.

THE WEATHER MAP—AN AID TO BALLOONISTS

By Dr. A. J. Henry.
OF MOUNT WEATHER RESEARCH OBSERVATORY.

THE majority of the contestants in the elimination race that took place from Indianapolis, Ind., on Sept. 17th, experienced baffling winds, rain and thunder storms, and were forced to make landings in the earlier stages of the race. The experience of these aeronauts is easily understood by reference to the daily weather map. On the morning of the 17th an extensive area of low pressure overlaid Minnesota, which during the day moved rapidly eastward so that its influence was felt throughout the upper Ohio Valley Sunday night. It should be explained that the lower layers of the atmosphere in an area of low pressure are in a turbulent state, that thunder storms and rain have their origin in areas of low pressure, that ascending currents of air, often of considerable strength, are sometimes experienced in the central portion of these disturbances. The experience of this observatory in attempting to make kite flights in lows confirms the foregoing in all essential particulars. It would seem therefore, that it would be the part of prudence to avoid as far as possible the central portion of lows in attempting balloon flights or any sort, especially those in which long distance flights are contemplated.

MIGHT HAVE DONE BETTER.

In the case in question a postponement of the ascensions for 24 hours would undoubtedly have given much more propitious weather and longer flights. The rear of a low and at only a moderate altitude, says 3,500 to 4,000 feet above ground, would seem to the writer as the most advantageous zone in which to achieve a successful long distance balloon flight.—Sept. 28th, 1910.

Alan R. Hawley

Member of brokerage firm of William Hawley & Co. Director of the Aero Club of America since its beginning. He has made a number of balloon ascents. In the 1907 Gordon Bennett he finished 5th.

BRITISH FABRIC TESTING DEVICE

By T. O'B. Hubbard, Sec'y.
AERONAUTICAL SOCIETY OF GREAT BRITAIN.

OWING to the increased demand for aeroplanes of all descriptions it has been found absolutely necessary to test the strength of the fabric which forms such an important part of their construction, and in order that full reliance can be placed upon the strain the fabric will stand, the machine has been designed by W. & T. Avery, Ltd., of London and Birmingham, for the National Physical Laboratory at Teddington.

The fabric of the required length is placed in specially prepared grips and the strain is applied by hand power, and the equilibrium is maintained by means of fine shot which is allowed to flow into a receiver suspended at the ends of a weighing steelyard.

The specimen may be of any length between 6 inches and the maximum of 25 inches, an elongation of 10 inches being allowed for beyond this dimension.

The weighing arrangement consists of a main lever and a steelyard, fitted with hardened steel knife-edges which rest on hardened steel bearings carried from the main standard.

The steelyard is graduated on both the back and the front, the front graduations range from zero to 200 pounds by one pound divisions, the graduations at the back of the steelyard from zero to 40 pounds by one-fifth pound divisions.

The front graduations are used when both the lever and the steelyard are being used as compound levers for indicating the loads.

When finer readings are required, the weighing system is swung round upon the standard so as to bring the rear knife-edge of the steelyard directly over the specimen; the main lever is then out of use and the steelyard is in operation as a single lever, the graduations ranging from zero to 14 pounds being then used. The end of the steelyard is fitted with a hardened steel knife-edge from which a receiver is suspended.

A spring balance is interposed between the receiver and the steelyard, the dial of which is graduated to show the breaking loads, i. e., up to 1,200 pounds, by sub-divisions of one pound, and 240 pounds by sub-divisions of one-fifth pound respectively. An upper reservoir is carried by a main standard and fine shot is allowed to flow from this to the receiver. The flow of the shot is regulated so that the load is applied to the specimen at the rate of 500 pounds per minute, and the flow is automatically cut off when the specimen breaks.

In preparing and applying the test, the specimen is connected to the roller attachment, the shot is allowed to flow from the reservoir into the receiver, and the strain is slowly applied with either of the two changes of gear, thus keeping the steelyard floating midway in the carrier. For low capacities the quick speed is used for the strain and the weighing apparatus revolved in the standard so as to bring the steelyard into use as a single lever. For high capacities the slow strain is applied and the result weighed by means of the main lever and the steelyard compounded together.

When the specimen has been broken, the receiver containing the shot is suspended from the link hanging from the rear knife-edge of the steelyard and then balanced by means of the loose proportional weights and the sliding poise.

It is a Remarkable Fact

That For the Past Six Months In America Every Novice Flight of any Moment Has Been Made With

ELBRIDGE
Featherweight Engines

¶ William Evans, experience one day, flew 30 miles 'cross country from Kansas City, Mo., with an Elbridge Engine.

¶ B. F. Roehrig, initial flight, safely carried intrepid young woman more than a mile at San Diego, Cal., using 60-90 Elbridge.

¶ J. J. Frisbie became in less than two weeks the admiration and envy of the flying camp at Mineola, L. I. Flew in wind and rain, carried passengers, flew 'cross country 14 miles after dark.

¶ George Schmidt, without previous experience with plane or motor, filled exhibition engagement successfully in Vermont, with an Elbridge Engine. Requa-Gibson propeller.

¶ J. E. Clark of San Francisco, large number of flights, with an Elbridge Engine.

¶ Numerous other flights by Dr. Wm. Greene, Rochester, N. Y.; Capt. Bumbaugh, Indianapolis; Henry C. Cooke, Mineola; W. C. McCollum, Kansas City; E. F. DeMurias, Mineola; Michael Paridon, Barberton, Ohio; B. F. Walsh, Santa Ana, Cal.; S. R. Skinner, Staten Island; J. J. Slavin, San Diego, Cal.; "Bud" Gaskell, Mineola, L. I.; Lieut. McManus, Oklahoma; J. R. Seeman, Washington; C. C. Bonnette, Vermont, etc., etc.

Examples multiply so rapidly it is impossible to print a complete record of flights made with Elbridge Engines.

¶ We know of no case in which the operator of any well constructed Aeroplane of standard type equipped with an Elbridge "Featherweight" Engine has failed to fly AT FIRST ATTEMPT.

¶ PROPER POWER IS THE SECRET OF SUCCESS: OUR INFORMATION BUREAU WILL CHEERFULLY ANSWER YOUR QUESTIONS. And the answers will be based on actual experience, not on guesswork. Write to-day for catalogue. Agents for El Arco twin radiators.

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In keeping up their thrust during flight—insuring high speed
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In correctness of design, excellence of execution and beauty of finish

THEY ARE IN A CLASS BY THEMSELVES

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Our propellers are calculated and designed for each machine. No uniform pitch "true screws."

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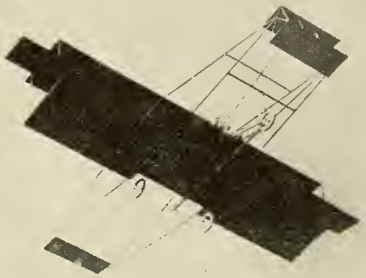
by
Cleve T. Shaffer



HAMILTON AT SACRAMENTO

E. P. De Berry, of the Pacific Aero Club, has a biplane almost ready for trial.

Main Planes.—These spread 30 ft. by 5½ ft. Farman type ailerons on rear edges. The fabric is on one side only and is treated with a secret preparation invented by De Berry's brother. It is both waterproof and elastic, will not crack and makes a smooth finish. The ribs are 4-ply laminated, ¾ x ¾, camber 3½ in., made by the California Aero Mfg. & Supply Co.

Chassis.—Suggestive of the Voisin. Two pivoted wheels which act, by the usual sliding collar, against a 1 ft. coil spring, which compresses a distance of 5 in. under shock. Two skids are fitted to the rear cell and skids such as used on the Wiseman-Peters will be placed on ends of lower plane.

Power Plant.—Rutenber motor, 30 h. p., weighing 198 pounds, drives direct a 6 ft. 6 in. diam. propeller of 4 ft. 6 in. pitch at 1,400 r. p. m. Thrust stated to be 230 pounds.

Controls.—Front and rear rudders. Elevator is operated by hand lever. Rear rudder by foot lever and ailerons by shoulder brace.

Total surface, main planes, 330 ft. Weight, without operator, 600 pounds.

Messrs. Wiseman & Peters, a complete description of whose biplane was given in the September number of AERONAUTICS, are now at work on a new machine, which will embody the ideas and improvements gained from experience with their first aeroplane. They expect to make exhibition flights with both machines. Mr. Wiseman has made some very good flights recently.

W. A. Merralls, of the Pacific Aero Club, a well-known builder and designer of mining machinery, has turned his attention to aeronautics, and is now at work on a combination dirigible and aeroplane, which will incorporate many novel features. He is also constructing a motor of his own design, and of large horse power, in which the weight will be under 3 pounds per h. p. He has kindly consented to give AERONAUTICS a complete description when ready for trial.

Ivy Baldwin Flying.

Capt. Ivy Baldwin, the well-known aeronaut, who operated our army balloon in Cuba during the Spanish war, has followed the example of Captain Thomas Baldwin in deserting the lighter-than-air ranks, and adds his name to the growing list of California aviators.

But for a persistent run of bad luck he would now be touring the country on exhibition flights. His last accident was in an attempt to fly the Golden Gate when the machine became unmanageable in a strong, gusty, wind and crashed to the parade ground of the military reservation where the preliminary trial was to be made. At the weather continued uncertain the attempt to cross was abandoned.

Captain Baldwin's longest flight to date is 12 miles.

The machine used is, except in minor constructional details, almost an exact duplicate of the Curtiss, dimensions being the same throughout.

To the critical eye there are many of the constructional features capable of improvement, and, comparatively speaking, the workmanship appears a trifle crude.

The bamboo upright which extends above the top of the elevator plane to connect with the push rod, while no doubt of sufficient strength, should have some sort of bracing to the rear edge of the plane—a tube such as used on the Curtiss—as bamboo is notoriously treacherous and at this most vital point nothing should be left to chance.

The small tubing of the aileron pivots passes direct through the wood of the end struts. This should have a metal clamp or ferrule to be used as a bearing or reinforcement.

Aluminum sockets with eyes in three sides, for attaching wires, are used with the usual single bolt passing through center, instead of Curtiss type ferrule. Turnbuckles of novel design are used. A Hall-Scott 30 h. p., 4 cyl., water cooled engine drives direct a 6 ft. diameter 4½ ft. pitch propeller of the same make. Weight, 440 pounds, with operator 555 pounds.

Flights by B. F. Roehrig.

B. F. Roehrig, of San Diego, Calif., has for some time been making fine flights with his big biplane. In fact, he says he had made over five hundred short flights and that everything "seems to work satisfactorily." The cost of the machine has been given as $10,800.

The top plane spreads 45 ft., while the bottom is 34 ft., spaced 5 ft. 10 in. apart. The chord of the surfaces is 6 ft. 5¼ in., with the greatest depth 4½ ins. The length of the machine over all is 47 ft. and the weight 1,539 pounds, including the aviator and fuel. The front elevator has 45 sq. ft. and the rear 12½ sq. ft.

There are only two ailerons, set in the planes like the Farman, but they move up and down in opposite directions as in the Curtiss.

A 60-90 6-cylinder Elbridge engine turns an 8 ft. 5 in. propeller, 6 ft. pitch, about 1,300 r. p. m. The engine is giving entire satisfaction. The mechanics think that the propeller is too small for the engine. This propeller is made of laminated birch, 40 laminations, weight 32 pounds. McAdamite castings are used throughout. All woodwork in the machine is laminated, in the main uprights there being as many as 18 laminations, in the outriggers to the tail and in other places 7 laminations of hickory and spruce are used. Roebling cable is used for guying.

The Loose Monoplane.

This popular price machine is as well constructed as the large monoplane of the same make illustrated in the July number of AERONAUTICS, and embodies in its compact make-up some original ideas of novel description.

The adoption of wooden diagonal cross stays or bracing in the fuselage is the most striking feature, there being absolutely no guy wires used, except those guying the extremities of the planes to the lower part of the fuselage. Upon close inspection the machine is found to be built up almost wholly of a number of triangles, the advantage of which from a point of strength is well known.

First-class material of standard make has been used throughout, such as Palmer tires, Naiad cloth, Camasco ribs and Aviator cord.

Total spread 31 ft. 8 in. and 20 ft. 6 in., fore and aft.

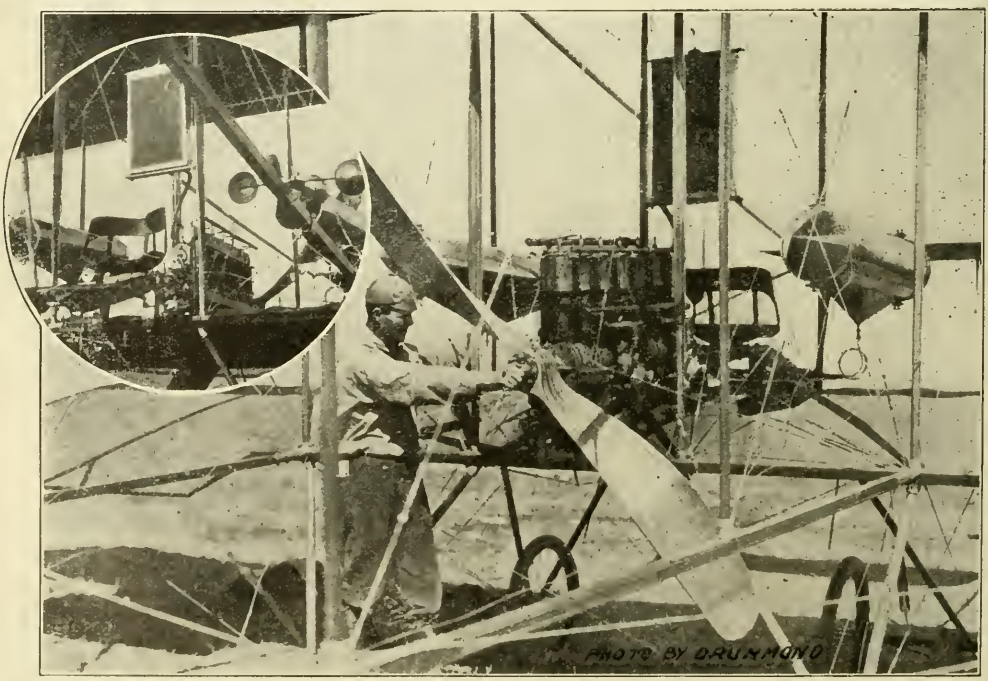
Planes in two halves, suitable for shipment. Single surface. Chord 5 ft., camber 4½ in, ribs ¾ x ¾ in., 4-ply spruce, made by the California Aero Mfg. & Supply Co. Beams 1¼ x 3½ in., are of oak and placed on top of ribs. The fabric, Naiad No. 2, is laced at the center, and also to a wire, which passes through the ferrules on rear ends of ribs, is tacked on under side of ribs. A drum tight surface is obtained. Incident angle can be varied by a simple adjustment.

Front edge of elevator is distant from the rear edge of main plane 9 ft. 7 in., and is moved by a push rod, connecting with a lever at the right hand. Surface, double covered, about 21 sq. ft.

Rudder, double covered, of about 8 sq. ft., is pivoted immediately in the rear of elevator and is operated by a foot-lever, as is the lateral stability device.

Fuselage is the usual triangle of the Demoiselle type, composed of 1-in. round ash, spruce and oak members, which are fastened securely by steel clips, making a very neat, strong and easily detachable connection.

Two 20 x 2¼ in. steel wheels equipped with Palmer tires support the machine in front, and two skids at rear. Wheel tread 56 in. Seat may be adjusted to balance motor. This machine would



Power Plant on Roehrig Aeroplane

Men Who Fly Every Day

MR. SCHMITT SAYS:

Rutland, Vt., Oct. 2, 1910.

To Requa-Gibson Co.
225 West 49th Street,
New York City.

Gentlemen:—

I purchased a propeller from you about three weeks ago, it was 7' in diameter with a 6' pitch and take this opportunity of expressing my complete satisfaction with your propeller.

I do not know the exact amount of thrust developed but the thrust was sufficient to raise my thirty-foot Curtiss type biplane with a forty (40) foot run from a standing start in my first flight in an aeroplane.

As I am flying in different parts of Vermont I have every opportunity of demonstrating your propeller and would like to have the State agency.

Trusting I will get some particulars from you soon, as I have some business waiting.

I remain,
Yours truly,
(Signed) George Schmitt.

The above flight was made with a C. & A. Wittemann 30 ft. biplane with a 40 H. P. Elbridge motor driving a ***Requa-Gibson*** *propeller.*

L. J. BERGDOLL MOTOR CO. SAY:

Philadelphia, Pa., Sept. 12, 1910.

Requa-Gibson Co.
225 West 49th Street,
New York City.

Gentlemen:—

In reply to your letter of the 12th, would say that we are certainly well pleased with the propeller which you made for our Bleriot Monoplane, 25 H. P. Anzani Motor.

At first we had some doubts as to whether we could get a propeller as good as the original one which came from France with the machine, but upon trial found that your propeller developed wonderful pull, and it is without doubt equal to the original propeller.

We made several good flights with the machine last Sunday and your propeller is certainly doing good work.

Very truly yours,
Louis J. Bergdoll Motor Co.
WILLIAM HAUPT,
Technical Manager.

¶ Here are two of our answers to those who "think cheap" or say "why pay more."

We invite all who have used our propeller to tell us their experiences. We will print your letter under above heading. Such positive statements from satisfied users help the progress of the art and sometimes lead an intending purchaser onto the successful route.

REQUA-GIBSON PROPELLERS

Send complete description of your machine. A telegraph deposit insures prompt attention. :: ::

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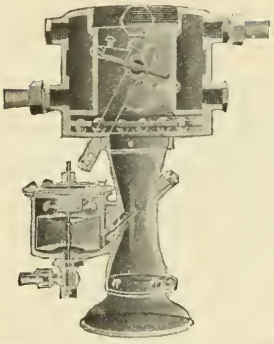

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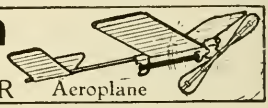

Our Skeeter has a new propeller; You ought to see it fly, it goes like a streak. The Jersey Skeeter Aeroplant is 8 ins. long, weighs 1-6 ounce, flies 30 feet. Sene prepaid 25 cents.

Lincoln Square Novelty Works, 1939 Broadway, N. Y.

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Sample Can Free.
WRINKLE PAINT MFG. CO., COLUMBUS, OHIO

appear to be suitable for the opposed cylinder type of engine. Later models have the spread cut down to 26 ft. and the chord lengthened to 6 ft., with a higher camber.

By Prof. H. La V. Twining.

LOS ANGELES, Cal., Oct. 6. On Oct. 22 and 23, the Aero Club of California will hold a local novice meet, in the aerodrome, some 12 miles from Los Angeles, where the club has its grounds and aerage.

The progress of the members of the club, who are building machines, will be clearly shown at this meet. A year ago none of the members had succeeded in leaving the ground. The club itself had no home. The big mid-winter meet of the following January was being agitated. The only members who had completed machines up to this time were A. L. Smith and J. S. Zerbe.

Mr. Smith's machine, a biplane, failed from lack of a proper motor, and Mr. Zerbe's multiplane refnsed to leave the ground at this time and during the meet.

To-day the club has two fliers in the persons of Walsh and Roehrig, formerly of San Diego. Duesler and Slavin of Los Angeles are able to make short flights. The Greer Bros. come next with still fewer and shorter jumps, while the Eaton-Twining machine brings up the rear with short hops to its credit.

The Cannon brothers have made some remarkable towing flights inside of the aerodrome. Their machine is a Curtiss biplane. They attached it to an automobile by means of a bridle attached to the lower end of the two forward struts near the middle of the machine. The running gear is not the same as the Curtiss. It consists of three wheels mounted on a triangular frame, two wheels being under the rear of the planes and one forward of the main planes. These wheels are flexibly attached to the frame by a spring mechanism, making the whole flexible and strong. They were towed in a circular course, a quarter of a mile in circumference. The machine weighs 350 pounds. Jack Cameron drove the aeroplane. On the first few trials they met with some accidents, but with a little practice Jack was soon able to manage the machine with skill and dexterity. After circling the course, the machine rose on the side of the course, which brought it facing the wind.

After rising from the ground, it maintained an altitude of from 10 to 20 feet, but on making the turns it sank lower, often scraping the runner at the tip of the plane on the ground for many feet, while making the turn. A spring balance was attached to the automobile, to which the bridle was made fast. At thirty miles an hour the balance showed a pull of 150 pounds.

One passenger was taken on, thus adding the equivalent in weight of a motor. Under these conditions it took a pull of over 200 pounds at thirty miles per hour to maintain the machine in the air.

The flights were maintained several times around the course, and the aeroplane was managed perfectly by the aviator, with his controls giving him excellent practice. In fact the skill with which the turns were negotiated, with and without a passenger aboard, indicate that Mr. Cannon will blossom into a full fledged aviator as soon as a powerful enough motor is installed. They are installing a 22½ h. p. Ford automobile motor, "T" model, which they are modifying to suit their purpose. These towing flights are the most remarkable of their kind, in so far as I know, that have yet occurred.

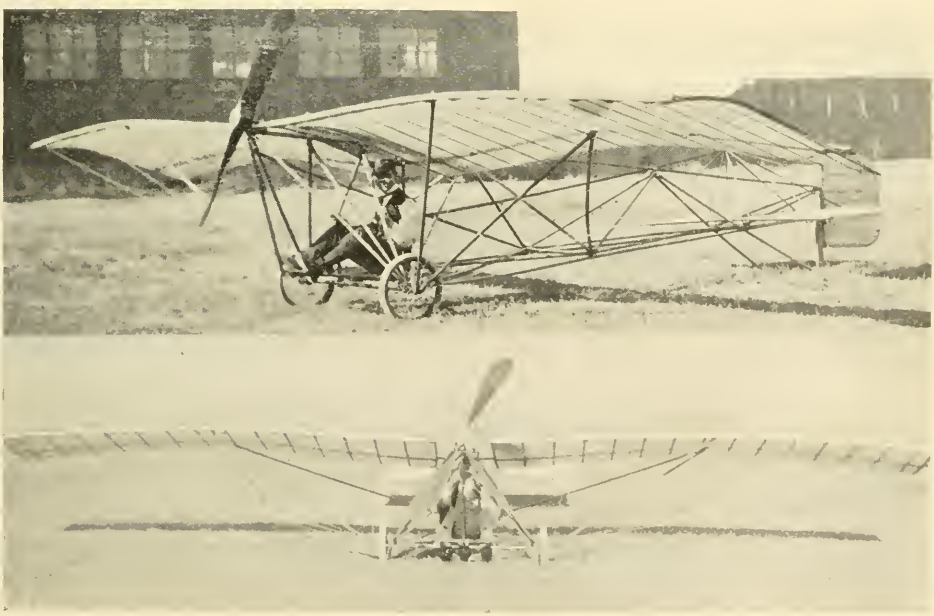
Besides the above mentioned machines, Mr. Thompson of Pomona and Mr. Day of Long Beach are planning to be at the meet. Mr. Thompson has made short flights. Mr. Day will have his machine on the ground next Saturday.

The Knabenshue cup was awarded to Mr. Roehrig of San Diego. On admission day he flew many times the required distance, and the directors of the Aero Club awarded him the cup.

The Citizens of San Diego put up a handsome cup for the aviator who should make the highest flight at the coming meet.

The Leonard Smith cup will go to the one who makes the longest flight. Other cups will be put up before the meet.

Both Willard and Hamilton are members of the Aero Club of California, so that in addition to the local men the club has on its membership roll two of the noted American flyers.



The Loose Monoplane

AT THE MINEOLA AVIATION GROUNDS

MINEOLA, N. Y., Oct. 12.—Mineola's flying grounds were quiescent for a period of several weeks following the graduation of the season's first flock of birdmen. Things were very lively there during July and August with Harmon, Baldwin, Frisbie and Tod Shriver flying almost every day. But during September they went their various ways—Captain Baldwin, Frisbie and Shriver to fill engagements in the West, and Mr. Harmon to Boston, and the field was left almost deserted.

October has brought renewed life to the place, however, and what with the return of the wanderers from their travels and the hatching of a new nestful of fledglings, the place is busier than ever.

Frisbie has come back with a new stunt, practiced and perfected, it is said, in Wilmington, Del. Accidentally, or on purpose, he effected a landing on the top of a large barn, whence he gracefully floated into a cornfield. Incidentally, Frisbie has the speed-bug and talks of replacing his present power plant with a big six-cylinder Elbridge engine.

Charles K. Hamilton, looking the ghost of his former self since his accident in California, is on the field nearly every day.

Among the new flyers who have been making successful trial flights recently are Henry Charles ("Dr.") Cooke, Chester Kaufman, E. F. De Murias and Wilson Post. Cooke has a modefied Curtiss type machine, with a spread of 34 feet in the upper and 29 feet in the lower plane. He has strengthened his machine in many ways and on October 8th and 9th he made half a dozen very pretty flights. Either luckier or more skilful than most, he made all of his landings safely, without so much as buckling a wheel or cracking a strut.

Kaufman was less fortunate if more spectacular. Taking out the practice machine belonging to G. E. De Long, he started across the field with the engine partially throttled down just to get the "feel" of the machine. But the temptation to try a flight proved irresistible and in a few moments he was flying very prettily across the field. Half a dozen straightaway flights were made successfully and then the novice, emboldened, tried the more difficult feat of circling the field. The "Graveyard" got him. He was turning nicely when one of the guy wires supporting the rear control gave way and the machine crumbled like a house of cards. Kaufman was extricated uninjured, but the "White Slave," as the machine is known to the denizens of Mineola, was sadly wrecked.

D. Massan, who came to this country last year with Paulhan, is now emulating his illustrious former employer in the realms of the air. He has nerve, and to spare, and great things are expected of him for the future. He is using a machine built by P. Brauner & Co., which is at present equipped with an automobile engine, but in which he expects shortly to try a four-cylinder Elbridge motor.

Bud Gaskell is another nervy youngster who has made a number of straightaway jumps, but who has not yet had opportunity to learn to make the turns.

Dr. H. W. Walden, who had quite a serious spill a couple of months ago, has recovered sufficiently in health and courage to give his machine another trial. Carrying a passenger he indulged in a few grass-cutting flights on October 8th. He has two 25-30 Anzani engines. The Walden-Dyat Company has been formed to build aeroplanes and a big shed has been erected on the Mineola field.

Joe Seymour has been away flying at the fair at Oneonta, N. Y. George Russell was away all last week flying at the fair at Danbury, Conn.

Herman Steinbrugge has purchased a monoplane which shows all the signs of strength rather than refinement in construction.

Miss Todd's machine is awaiting the arrival of a Rinek motor. The Rinek company is going to see that the motor runs perfectly and does perfect work in the machine, so far as money and experience can be used.

Harry Chandler and Glenn Ethridge, who have a biplane of their own type, have bought the tent that was formerly occupied by George Russell, and have moved into their new quarters.

The "Imp," built by Elmer Burlingame, has been taken back to Boston. Mr. Burlingame intends building a new machine this winter and bring it out next spring.

The Mohawk Aviation Co. has succeeded in breaking one wing of their Curtiss-type biplane in landing the other day. They have just pitched a new tent in the parking space.

Harmon, while attempting to fly for the Chinese prince, smashed his running gear. Tod Shriver, after being introduced to the prince, got into his machine and flew to the far end of the field and returned, in a strong wind, making the flight at an average height of 10 to 15 feet.

Harry Harkness has done some fine work with his Antoinette machine, making several complete circuits of the field at an altitude of from 15 to 35 feet.

Grahame-White has been making some flights with Harmon's reconstructed Farman, taking up various passengers. He seems to value his services highly as an attraction for exhibitions as, it is said, his price was $25,000 for a week of flying at St. Louis.

BOOK REVIEWS

"The Airy Way," by George A. B. Dewar, 8vo., cloth, 253 pp., $1.75. The Macmillan Co., New York. "The Airy Way" is in the main a book of flight; its theme is the magic and mystery of the master-feat in all Nature. The author has been watching for many years the wing feats of birds, bats, and insects; amongst others, the feats of the swift, the swallow, the rook, the herring gull, the saddle-back gull, the black-headed gull, the golden-crested wren, the woodpeckers, the fritillary butterflies, the purple emperor butterfly, dragon-flies, syrphi flies, bees, the pipistrelle bat, and other species of its kind. It is perfectly simple, written throughout in the simplest English.

"Percy Pierce Flyer," pamphlet giving full directions for building the Pierce model, together with large size scale drawing. Published at 15c. by Spon & Chamberlain, 123 Liberty St., New York.

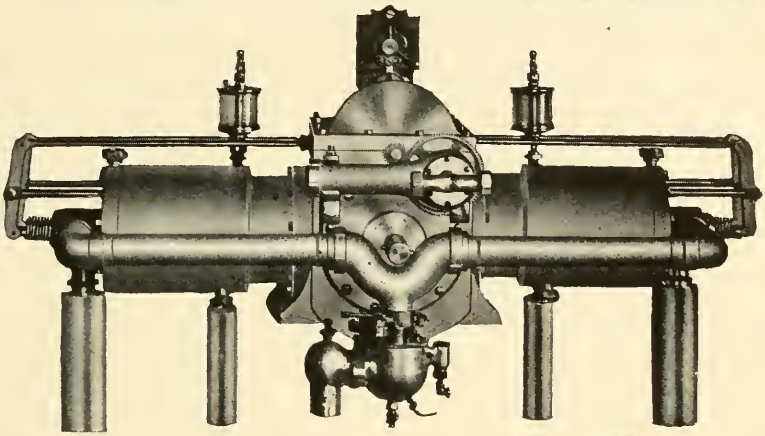
"Model Balloons and Flying Machines," by J. H. Alexander, M. B., A. I. E. E., small 8vo., cloth, 127 pp. ills., with 4 sheets of good drawings with details for model building. Published by Norman W. Henley, 132 Nassau St., New York, at $1.50.

Formulaire Pour La Construction Des Aeroplanes.—Un volume de poche.—Prix: 3 francs.—*Librarie Aeronautique, 32 rue Madame, Paris.*

Divisé en cinq grands chapitres: Résistance de l'air, Dynamique de l'aéroplane, Propulseurs aériens, Moteurs, Résistance des pièces d'un aéroplane, cet ouvrage donne sous un format commode l'exposé succinct de toutes les formules et méthodes de calcul ce qui permettra à chacun d'avoir toujours sous la main un résumé parfait de l'état actuel de la science aéronautique.

The *Intercollegiate* for October certainly ought to prove of value and interest to every college man who is a member of the Associated Clubs. This number contains heart to heart talks from each of the University aero clubs, and a short review of the aero journals.

FACTS ABOUT MOTORS



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was for the first time in America demonstrated as an attraction at the Harvard-Boston Aero Meet.

¶ There it was shown how easily a man could be sent 200 ft. in the air supported by from 6 to 15 enormous 18 ft. passenger carrying kites.

¶ The height to which he can go (up to 1,000 ft.) varies only with the wind velocity and nerve of the operator.

¶ The Army officers present testified as to its great value for scouting purposes in war.

¶ As this feature is at its best when the winds are so strong that the aeroplanes cannot fly, it is especially valuable as an attraction at Aeroplane Meets.

SAMUEL F. PERKINS, 110 Tremont St., Boston, Mass.

News In General

Hearst $50,000 Prize.

The *New York American* has offered a prize of $50,000, open from October 10, 1910, to October 10, 1911. The conditions are as follows:

The distance, approximately 3,000 miles, must be made in 720 continuous hours, or 30 days. Start must be made either from Boston or New York City, finish made at Los Angeles or San Francisco, or vice versa, from West to East. A landing must be made in Chicago on the way. It is optional with the contestant whether East or West. Any route may be chosen, stopping as often as wanted, and as long as desired in any town. It is permissible to make flights of any distance or duration providing entire distance is traversed in consecutive town to town flights within the time limit of 720 hours or 30 days. Aeroplane may be repaired as often as desired. Any broken, damaged or defective parts may be repaired or replaced at the option of the contestant at any stage of the flight, and as frequently as the judgment of the contestant may dictate. To all intents and purposes, the contestant may rebuild the aeroplane on the way by substituting all the damaged or broken parts, or any other similar machine, but the prize winner must use the same machine throughout. Any type of self-propelled aeroplane or a heavier-than-air flying machine capable of carrying the contestant may be used. Any person, regardless of sex, nationality, race or residence is eligible to compete. Fourteen days before attempting the flight, contestants must deliver in writing to the *New York American* approximate time and place of start, route and point of finish. There are no other conditions.

Incorporations.

Reimers-Mair Biplane Co., Chicago, $2,500; A. P. McArthur, F. C. Reimers and J. E. Mair.

Romano Aerial Navigation Co., of Seattle, $250,000; Jean Romano, C. I. D. Looff and William Looff.

Aerial Equipment Co., Manhattan; manufacture aviation equipment; capital, $2,000. Incorporators, Benj. S. Catchings, No. 276 Fifth Ave.; Yves de Villers, No. 735 Seventh Ave.; F. H. Johnston, No. 315 Fifth Ave., all of New York.

Buchanan Aeroplane Co., Detroit, $5,000; Wm. L. January and George A. Marsh.

Morrison Automatic Flying Machine Manufacturing Company, Cincinnati, O., $10,000; Sylvanus S. Morrison, S. O. Needham, W. L. Buckman, D. T. Fenner, F. C. Waltz.

St. Louis Show Increases Space.

Arrangements have just been concluded whereby the Coliseum in St. Louis, scene of the first aero show of the Aero Club of St. Louis, November 17th to 24th, will have fully one-third more exhibition space than at an exhibition ever held there before. This has been found a necessary measure to accommodate the large number of exhibitors, many of whom will show complete aeroplanes.

Although the regular capacity of the Coliseum provides floor space almost equal to that of the great Madison Square Garden in New York, a raised platform running entirely around the arena will be constructed and used for the first time at the aero show. By this system there will be room for exhibitors all the way around the platform, the space being about ten feet deep and the platform itself fifteen feet wide.

The platform will also serve as a promenade for spectators and a starting place for the races between model aeroplanes, a number of which have already been entered for the prizes offered.

When the plan of holding an aero show in St. Louis was originally considered by the Aero Club of St. Louis, it was thought that there might not be enough of an aero industry already established to make it a success, and it was argued that builders of apparatus would be unwilling to pay money for space.

Both of these objections have been met, however, for there are more than eighty thriving manufacturers in the United States. The money which they pay for space is only a guarantee for the Aero Club to finance the undertaking. It cannot fail to be of great benefit to all concerned, and the profits of the show are to be divided pro rata among the exhibitors afterwards. In this way the exhibitors will not only be freed from all expense for their space in the end, but may even reap a dividend.

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SOME NEW AERO MOTORS

The Roberts Aeronautical Motor.

A new motor is ready for the market, built by the Roberts Motor Co., Sandusky, O., which company has had years of experience in both gasoline engine design and construction, and in aeronautics. The designer, Mr. E. M. Roberts, M. E., was formerly chief assistant and designer to Sir Hiram S. Maxim, on his celebrated aeronautical experiments in England in '94 and '95.

Mr. Roberts has been for the last ten years considered one of the foremost designers of gasoline motors in this country and a leading authority on this subject. He has designed over one hundred and seventy-five different gasoline engines and is the author of seven books on gas engines and kindred subjects.

In the Roberts aeronautical motor all freak ideas and untried plans have been avoided. No motors are better known for ease of starting, flexibility of control, smoothness of running and continuous operation without missing, than the Roberts marine and automobile motors.

Roberts marine motors are used to a great extent for racing where they have to run at speeds from 1,000 to 1,200 revolutions for hours at the time, and where the least bit of trouble would lose a race. The Roberts motor has a long list of victories, many of them are with boats more powerful than the boat powered with the Roberts motor, and a great many of the wins are due to continuous smooth running without mishaps of any sort.

Quite a little of this success is due to the long bearings, especially on the crankpins. The Roberts motor is 4½ in. bore by 5 in. stroke, and the crankpin is 2½ in. long. This means continuous running without heating. The pistons are long and equipped with three rings. The bearing surface is nearly 30 per cent. longer than used in a great many of the high speed types of this size. The engine is of the customary 3-port type construction with the exception that instead of the port to the crank-case being controlled by the piston. A rotating tubular valve is employed by means of which the timing of the opening to the crank-case can be better controlled and greater economy can be secured than with the regular three port type.

The motor is fitted with the well-known Roberts cellular bypass, which absolutely prevents back firing or base explosions and permits operation on a very dry mixture not overloaded with gasoline. The motor can be run at low speed on a normal mixture of gasoline vapor and air.

The water circulation is by means of a large gear pump cast in one piece with the crank-case, pumping into a passage in the crank-case and then through a passage in the cylinder walls in which the water flows around the exhaust passages and keeps the motor from overheating.

It will be noted that part of the water jacket is cored into the cylinder casting, the balance being covered with an aluminum water jacket into a groove in the cylinder itself. Steel cylinders, cast iron pistons, and bronze rings are used, and the crank-case is of magnalium.

The iguition is by a Bosch magneto with special advance mechanism by means of which the drive of the magneto is advanced and all sparks occur at the hottest point in the ignition curve.

The motor weighs complete with Bosch magneto and carbureter 165 pounds, and will develop 40 actual brake h. p. at 1,000 r. p. m., 46 h. p. at 1,200, and 52 h. p. at 1,400.

The motors are guaranteed against defective material and workmanship for one year from date of sale.

The price including radiator and propellor especially designed for your aeroplane will be $1,500.

Fox Aero Motor Just Out.

Fox De Luxe Aero Motors have been on the market for some time, but the manufacturers have withheld all information until this edition of AERONAUTICS waiting until they could complete their line of aero motors and make a number of important tests under actual working conditions; these tests have now been completed by their chief testor at Mineola, Long Island.

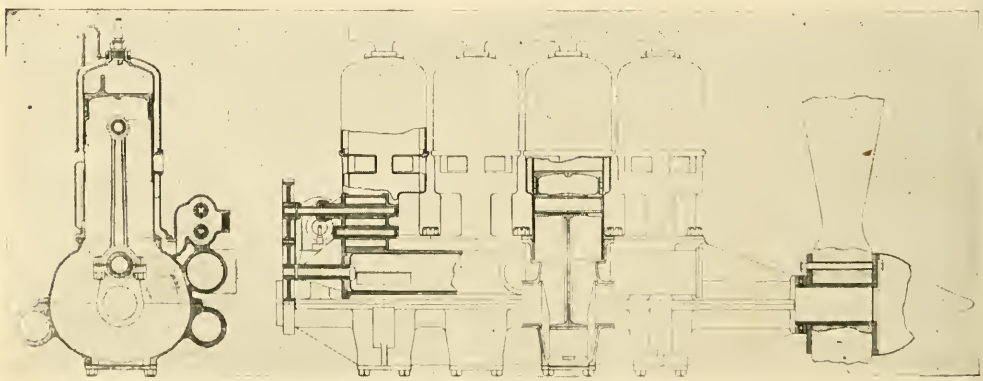
There are several features about Fox aero motors, most important of which is the Fox fourth port accelerator, which enables the operator to perfectly control the speed of the motor during flight.

Second. The radiator is mounted on the engine and there is forced circulation of cooling water. These motors have been run on chassis tests for two hours without changing the water or making outside connections.

Third. Each motor is sent out on thirty days' trial, under a broad guarantee to refund the buyer's money if the motor does not prove satisfactory in every respect.

It will be remembered that the same company has been manufacturing Fox marine motors for years, and the endurance qualities have been tried out in their speed motor boat, "Br'er Fox," which made a remarkable run from Cincinnati to New Orleans, a distance of 1,554 miles, at an average speed of 29.08 miles per hour. These aero motors are of the same type but lighter in construction.

The policy of this company in making a complete series of tests before advertising that they are in a position to fill orders should be commended. The great demand for aero motors opens up a big field for the experienced engine manufacturer. Full details will be furnished by The Dean Manufacturing Company, "South Cincinnati," Newport, Ky.



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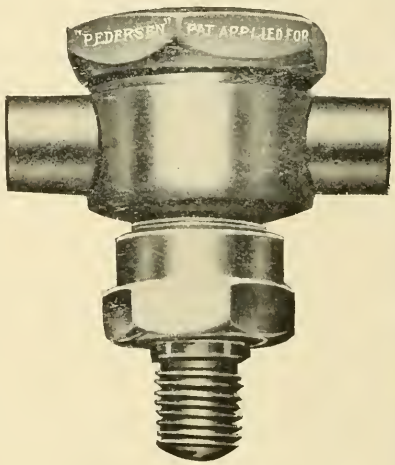

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The D. L. Herman Motor.

After a great deal of experimenting between one of the well-known men in the aviation field and one of the largest gasoline motor builders in the country, they have developed a very high grade, dependable aerial motor, V type, 8-cylinder, 4-cycle motor, having L-type cylinders cast in pairs. The reason that eight cylinders were decided on is that an engine with this number of cylinders gives continuous power with little vibration—something which is necessary in the air and which cannot be gotten with two, three or four cylinders. The hollow crank shaft, which is made from Krupp's best grade of crusible chrome nickel steel, has three line bearings of die-cast, cadmium nickel bronze, which material is also used on the piston pin bearings in the piston.

One of the patented features, and one which makes this motor unique, is the single cam shaft of one-piece construction, hardened and ground. This cam shaft not only operates all 16 valves, but also drives the centrifugal pump, giving positive circulation. This construction eliminates 36 moving parts, and also eliminates all pins, etc., which are liable to work loose and cause trouble. The cam shaft gear is of special alloy steel, running into an intermediate fibre-filled gear, thereby making a light, and at the same time silent, train of gears. The valve tappets are hardened and ground, having fibre inserts. Another special feature is the valve, which has gray cast iron heads fused on steel stems by a patented process, which not only makes it impossible for them to wear loose, but also gives a valve head of a material which has the same expansion as the iron of the cylinder, thereby eliminating breaking of valves.

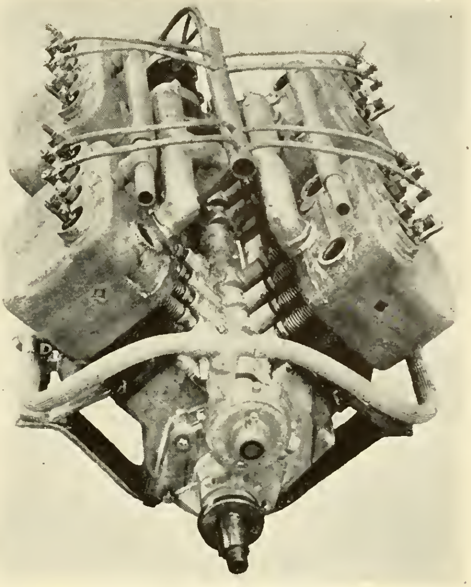
The builders were not suited with aluminum, and decided that the only material to use was "Aerial Metal," which is produced by a well-known foundry in this country. It is claimed to be fully 15 per cent lighter than aluminum and one-half again as strong. This material was used not only for the crank case, but also for the water jackets, pipes, gear housings, and, in fact, wherever a light alloy could be used without jeopardizing the serviceable properties of the motor. The crank case has spacious hand holes, which make the connecting rod bearings very accessible. The water jacket being cast separate from the cylinder makes it possible to thoroughly inspect and check up the iron cylinder castings in a way that could not otherwise be attempted. These jackets are not shrunk on, but are bolted into position with chrome nickel steel bolts in such a way that the difference of expansion between iron and aerial metal may be taken up in the bolt holes, so that should a cylinder get hot the water jacket does not crack.

The oiling system is splash, with force feed oiler to crank case, the reason for this being that this makes a positive method of lubrication. It might also be mentioned that a majority of the successful automobile motors use a force feed oiling system.

The ignition system is high tension, any magneto desired being supplied with the motor. These motors are built in two sizes. The smaller has a 3⅜-in. stroke and 3⅜-in. bore, and develops at 1,800 revolutions 45 h. p.; at 1,200 revolutions 34 h. p.; and completely equipped, ready to run, weighs less than 175 lbs. The hollow crank shaft is 1½ in. diameter, end bearings 4½ in. long, center bearings 3½ in. long, pin bearings 1 11/16 in. long, piston pin ¾ in. diameter, valves 1½ in. diameter. This motor sells at $1,750.

The larger motor has 4-in. bore and 4¾ in. stroke, and will develop at 1,800 revolutions 70 h. p.; at 1,200 revolutions 56 h. p.; and when completely equipped and ready to run will weigh less than 210 lbs. The hollow crank shaft is 1¾-in. diameter. The end bearings and the center bearings are 4½ in. long, the pin bearings are 2 in. long. The piston pin is hollow and ⅞-in. diameter. The valves are 2-in. diameter. This motor sells for $2,500.

In order to prove the dependability of these motors by the most gruelling test possible, one of the smaller of these motors was mounted in an automobile truck, the manufacturers state, and run over 5,000 miles on very rough roads, loaded with sand and pig iron, and has not required repairs of any kind. This motor is expected to run until it breaks down. It has been run on the block without a stop for 72 hours at full load under brake test, and it has been turned over as high as 4,200 revolutions per minute.



The Herman Motor

General Machinery Co. Build Aero Motors.

The General Machinery Co. of Bay City, Mich., have for years had unqualified success in their production of the famous Smalley marine motor, and discovered something over a year ago a method of casting an aluminum cylinder with cast iron liner for the piston travel, which enhanced greatly the power and lightness of their motor, and met with the unbounded approval of boat motor users for its lightness, greater power and remarkable beauty. They have been quietly and seriously at work to produce an all aluminum airship motor that would meet all the requirements for power, reliability and lightness of weight, with all the good points that made their marine motor so famous a race winner and so popular with the discriminating users of boat motors. They have named their aviation motor the Smalley-Aero and now have it complete and perfect in every detail. The great lightness of this motor is obtained by its material—aluminum—and no factor of safety has been risked by cutting down the working parts or in any way sacrificing strength for weight.

The Wright Brothers' first power flight was made on Dec. 17, 1903.

Curtiss' first was in the "White Wing," of the Aerial Experiment Association, May 22, 1908. His first in the "June Bug" was June 21.

Ralph L. Bray, of 560 Broadway, Long Branch, N. J., has completed two machines, a monoplane and a Curtiss-type biplane. The Curtiss machine has 30 ft. spread by 5½ ft. fore and aft in the main planes, which are spaced 5 ft. apart. Without the motor it weighs less than 250 pounds. The builder is now looking for a motor.

During the recent exposition held at Rochester, N. Y., the Bausch and Lomb Optical Co., presented to the city a Stevens-built balloon. This was suspended half a mile above the city, from which an American flag 80 by 100 ft. was flown.

George A. Richardson, president of the Intercollegiate Aeronautical Association, has started a series of aero lectures. The first was before the U. of P. and the next before Swarthmore. Both were well received. Mr. Richardson is a U. of P. man, 34 Rodney Dormitory, Philadelphia.

NEW AERONAUTICAL PATENTS

The name of Thomas A. Edison attached to an aeroplane patent naturally calls forth public attention. His interest in aeronautics apparently dates from Farman's financially disastrous—for the backers—visit to America several years ago.

It seems peculiar that the first impulse, after copying the flapping of the bird, is to follow the theory of the helicopter, eventually drifting to the aeroplane as the problem more easily solved. Perhaps the helicopter will yet be a reality.

The Edison invention provides for a series of aeroplane members, which, on being rotated through the air about a central axis of the machine as a center, and held at a given angle to the horizontal, will exert a lifting force transmitted to the body of the machine. Preferably, these aeroplane members are in the form of box kites 22, which are connected to the frame of the machine by flexible means as cords or wires 23, and are sustained during rotation by centrifugal force. Means are provided by which the inclination from front to back of the aeroplane members to the horizontal may be changed, the lifting force exerted by the air on such members depending on the angle of inclination of said members as well as on the speed of rotation.

Flexible propellers have been successfully employed in the Parseval dirigible.

The apparatus is provided with a central vertical shaft 3, which rotates in a bearing 4 in the floor or staging 1. The shaft 3 is likewise supported by a bearing 5 in horizontal member 6, which is supported from floor 1 as by vertical members 7 and 8. Members 9, 10, etc., mounted on the member 6 support a sleeve 11 which constitutes the upper bearing for vertical shaft 3.

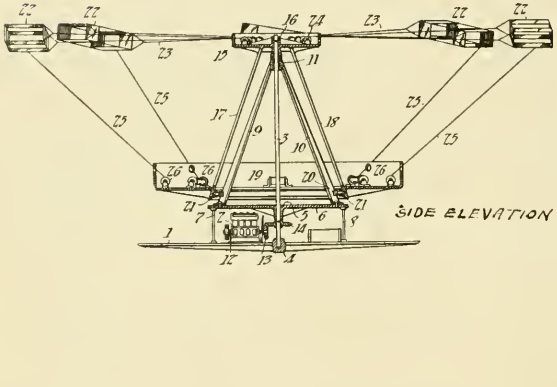
Shaft 3 is rotated within bearing surfaces 4, 5 and 11 from the engine 2 which carries on the shaft 12 thereof, a bevel gear 13 meshing with bevel gear 14, pinned or fastened to shaft 3. Upper and lower members are fastened to shaft 3 to rotate therewith and are likewise fastened together. The upper member 15 is formed with a central hub or sleeve 16 fastened to shaft 3, which bears on sleeve 11 of the stationary frame of the machine whereon it may revolve with the aid of any antifriction device. This platform 15 is secured as by members 17, 18 to a lower platform or horizontal member 19, which is adapted to rotate about the stationary frame, bearing in its rotation on member 20 of said frame, which constitutes a ring, rollers 21, 21 of the rotating platform 19 having rolling engagement therewith.

Piano wires or other flexible means 23, extend from loops attached, one to the forward end, the other to the rear end of the inner side of each of the kites. These wires 23 are secured to rotating platform 15 at the upper end of rotating shaft 3, preferably by means of reels 24, by which the length of connections 23 may be regulated. By such connection, when shaft 3 is rotated, the kites 22 are acted on by centrifugal force to rotate in the horizontal plane of reels 24 when the speed of rotation of shaft 3 is sufficiently great. The tendency of the center of gravity of the kites to fly to the greatest possible radial distance from shaft 3 would cause the kites to rotate with the upper and lower members thereof horizontal, the side to which wires 23 are attached being the inner side during such rotation, if no additional means were provided to cause said upper and lower members to assume a fore and aft slant. Piano wires, or other flexible connections 25 constitute such means, however, and are attached to the edges of the kites which constitute the rear edges during rotation, these wires being attached to the lower rotating platform 19 by means of reels 26. By means of these reels a greater or a less amount of wire 25 may be wound in or let out, thus controlling the horizontal angle of members 22 during their rotation. The kites 22, when so governed, constitute practically a screw, the pitch of which may be changed. The lifting force caused by the revolution of members 22 is due to the vertical component of the force exerted by the atmosphere upon the kites in their rotation. This force increases, of course, with the velocity at which the kites travel in their circular path. This force likewise varies with the angle of inclination of the kites as they are forced through the air, and this may be regulated through reels 26. The tendency of the centrifugal force acting on the kites is to keep the forward end of the kites up to the horizontal plane in which reels 24 are situated. Cords 25 restrain the tendency of the rear ends of the kites to also revolve in the same horizontal plane, and by shortening these cords, the angle of inclination of the kites may be increased. If desired, reels 26 may be connected together so that the angle of horizontal inclination of all of the kites may be instantly

T. A. EDISON.
FLYING MACHINE.
APPLICATION FILED NOV. 16, 1909.

970,616. Patented Sept. 20, 1910.

Fig. 1



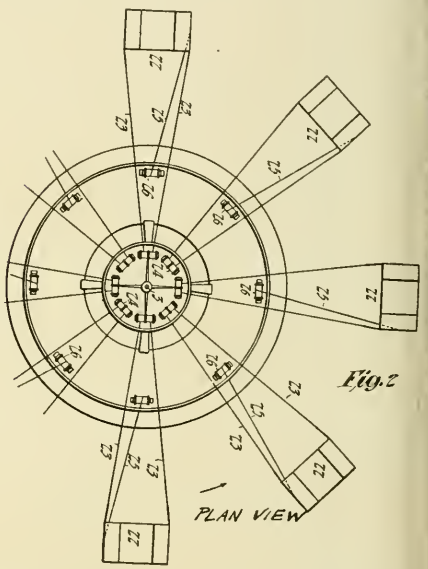


Fig. 2

WHY NOT USE THE
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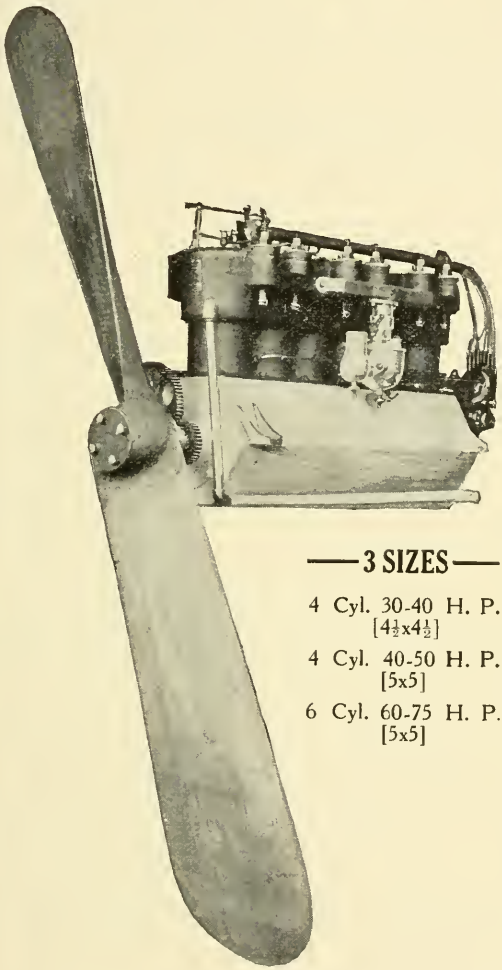

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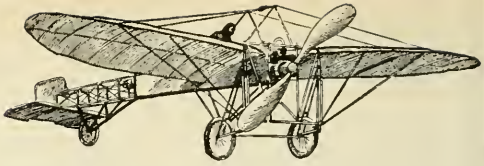

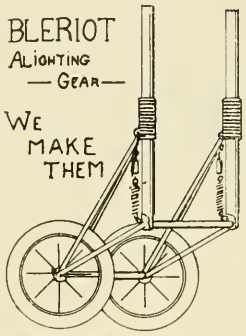

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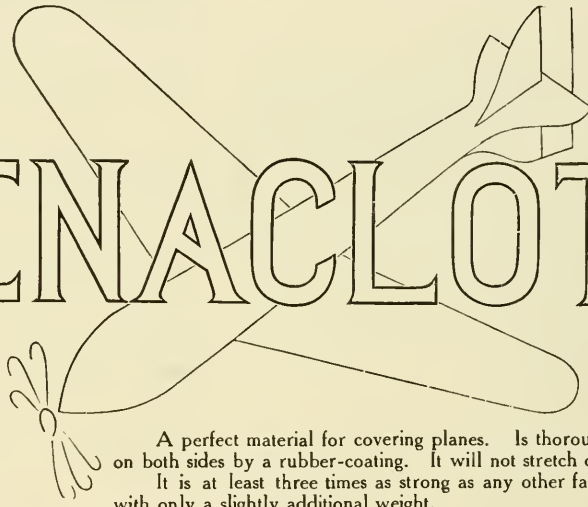

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changed at will by the operator of the machine, this change of the angle of inclination constituting means for governing the lifting force exerted on the machine. If desired, also, spring connections may be provided between reels 26 and wires 25, adjusted for any desired speed of rotation to allow reels 26 to act in tension between certain limits, and to allow the angle of pitch of the kites to vary somewhat from a given desired angle according to the conditions.

It is obvious that kite members 22 may take the form of any aeroplane members now known to the art, either of flat surfaces or surfaces somewhat curved, and furthermore, that various changes in the construction and details of the device disclosed may be made without departing from the spirit of the invention.

Louis R. Adams (a vice-president of the Aeronautical Society), New York, N. Y., 965,792, July 26, 1910, filed Feb. 5, 1909. AEROPLANE, one feature of which is for the central portion of the lower plane to be in advance of the upper plane. Another feature is to produce a rigid structure of light weight and novel design; the frame of the two planes consists of four principal members, the ends of which are secured together in groups of two. Spreader rods between these members cause a bow, forming a downward curve in lower plane and upward curve in upper plane. Ribs between the members of each plane separate them and form a suitable surface for attaching the covering.

Samuel H. Gilson, Salt Lake City, Utah, assignor of one-third to Jay S. Milner, Salt Lake City, 964,771, July 19, 1910. Filed July 27, 1909. AEROPLANE, the characteristic feature of which is that the planes are pivoted to the body or chassis so as to rock thereon like a see-saw to maintain lateral stability.

Halvor Olsen Elane, U. S. Navy, 964,957, July 19, 1910. Filed June 1, 1909. FLYING MACHINE, comprising a main plane having uprights at the top of which two bars or shafts extend at right angles to each other. One shaft supports planes while the other supports propellers and this upper structure is capable of a rocking movement without interfering with the transmission and rotation of the propellers.

Hans Schonboe, Omaha, Neb., 965,021, July 19, 1910. Filed Oct. 15, 1909. FLYING MACHINE. A gas envelope supporting a sling and saddle to maintain the operator in an upright position. "Auxiliary buoyant bodies" connected with the feet and hands to serve as propelling means when reciprocated.

Frederick H. Wales, Imperial, Cal., 965,969, Aug. 2, 1910. Filed Nov. 4, 1909. FLYING MACHINE. An aeroplane with superposed surfaces and a car pivotally suspended from the lower plane so connected to the upper plane as to cause the latter to slide when the machine tilts and thereby produce automatic equilibrium.

Malcolm Grover Adams, Parsons, Kan., 966,151, Aug. 2, 1910. Filed Dec. 5, 1908. FLYING MACHINE. An aeroplane consisting of a plurality of superposed planes, of dome-like form, and arranged in pairs. One set being below the car and the other above.

George Otis Draper, New York, N. Y., 965,881, Aug. 2, 1910. Filed Dec. 3, 1909. LANDING AND STARTING APPARATUS FOR AEROPLANES. An upright pillar is provided at the top with a horizontal arm pivotally mounted thereon; at the outer extremity of the arm is a "ring like receiver" suspended therefrom to receive a projecting member of an aeroplane.

Hermann Gotham, Celle, Germany, 966,395, Aug. 2, 1910. Filed Sept. 22, 1909. MEANS FOR SHELTERING the landing places of airships from the force of the wind, consisting of a compressed air conduit surrounding the landing place and provided with orifices which may be opened and closed at will. The purpose is to issue air currents of great velocity in an upward direction to protect the balloon or airship while landing.

Albert Hugg Friedel, Baltimore, Md., 967,359, Aug. 16, 1910. Filed Aug. 28, 1909. FLYING MACHINE of the aeroplane class having a multiplicity of surfaces, both horizontal and vertical, bisecting each other. Movably adjustable planes are also provided at the top of the structure consisting of outwardly and upwardly projecting planes to which are secured outwardly and downwardly projecting planes. At the rear a horseshoe shaped section is connected to one of the horizontal planes.

Louis Bleriot, Neuilly-sur-Seine, France, 967,712, Aug. 16, 1910. Filed Mar. 25, 1909. RADIATOR for flying machine motors. A series of flexible sheets form a common wall for interconnected annular cups as a means for conducting water from the motor. Each cup is connected to two reservoirs, through one of which the water is admitted and through the other the water escapes in the circulation to and from the motor.

Romain de Bersaques, Washington, D. C., assignor to De Bersaques Safety Aeroplane Co., a corporation of South Dakota, 967,711, Aug. 16, 1910. Filed Aug. 14, 1909. AEROPLANE, a boat for chassis, wheels mounted on the boat, propeller shafts provided with screws at both ends and planes projecting from the sides of the boat pivoted thereto with means for manually raising or lowering the planes in unison. There is also a vertically disposed rudder and yielding fins projecting from the top and bottom of boat and frame.

Frederick H. Schluster, St. Louis, Mo., 967,571, Aug. 16, 1910. Filed June 24, 1909. AERONAUTIC SAFETY APPLIANCE. The object of this invention is to reduce the danger in learning to operate an aeroplane. A captive balloon is secured by guy ropes diverging to their ground anchorage. From a pulley attached to the balloon depends the heavier than air machine, the height of which is controlled by a travelling connection on one of the guy ropes. The extent of motion of the aeroplane depends on the length of rope and height of balloon, and the divergence of the guy ropes anchoring it.

John Wills Cloud, London, England, 968,127, Aug. 23, 1910. Filed Mar. 9, 1909. APPARATUS FOR AERIAL MACHINES, nautical ships, vehicles and other purposes. This invention has for object to balance two motors placed side by side so that the crank shafts will be parallel and geared together to run in opposite directions, and for the reciprocating parts to work oppositely in each engine to balance each other. Propellers are rotated by each engine.

Jacob H. Buss, Saltillo, Tenn., 968,120, Aug. 23, 1910. Filed July 2, 1909. FLYING MACHINE of the helicopter class, comprising propellers on vertical axes driven by gears from a motor and a propulsion propeller on a horizontal shaft driven by a friction disk splined to said shaft and engaging the plane face of the gear wheels. A shipper lever regulates the position and speed of friction disk.

Gerald Geraldson, Newcastle, Cal., 968,339, Aug. 23, 1910. Filed Jan. 14, 1909. AEROPLANE LAUNCHER AND LANDER. A tower having at the top two horizontal opposite branches in the form of a T is provided with a cable, for each side, on pulleys for raising and lowering. Each cable, intermediately of its ends is connected by means of a pulley wheel with a pneumatic element consisting of a cylinder and piston to serve as a cushion. The aeroplane is screwed to a releasable hook on the pendant end of the cable.

Julius Schulke, Jenn, Germany, 968,700, Aug. 30, 1910. Filed June 4, 1907. FLYING APPARATUS of the ornithopter class, comprising propelling wings arranged in groups on the sides of car. The wings are of concavo-convex form, the concave sides remaining downward, while the outer tips have axially movable vanes so arranged that on the downstroke the vanes assume a downward slanting position to assist the forward propulsion. Valve flaps on the wings allow escape of air on the up-stroke.

Frederick B. Kummer, Sheboygan, Wis., 968,860, Aug. 30, 1910. Filed Nov. 22, 1909. FLYING MACHINE of the helicopter class with one propeller on a vertical axis and one a horizontal axis at the rear for propulsion. The latter is secured on a flexible shaft manually adjustable for steering.

Charles E. S. Burch and Frederick R. Burch, Seattle, Wash., 968,918, Aug. 30, 1910. Filed Oct. 5, 1908. FLYING MACHINE provided with vertical and horizontal screws, and at the upper extremity a parachute comprised of a plurality of rings secured about their outer peripheries to the framework.

NOTES FROM ABROAD

CHAVEZ MAKES MOST DARING FLIGHT OF HISTORY, SAILING OVER THE SIMPLON PASS TO ITALY.

Ends in Death.

DOMODOSSOLA, Italy, September 27.—George Chavez, the Peruvian aviator, who was injured in alighting after his flight over the Alps, died at 2.25 o'clock this afternoon.

Chavez, who was 23 years old, attracted attention first Aug. 3 last, when, at the Blackpool (Eng.) aviation meet, he reached a high altitude. Sept. 8, at Issy, France, he established a new altitude record officially determined at 8,403 feet. The accident which resulted in Chavez' death occurred Sept. 23 on his second attempted flight from Brig, Switzerland, to Milan, Italy, for a prize of $14,000, offered by the Italian Aviation Society of Milan. He was descending at Domodossola, and his machine was within thirty feet of the surface when one of the wings collapsed and the Bleriot monoplane fell in a heap, carrying Chavez beneath it. Both of the aviator's legs were broken, his left thigh was fractured, and it is supposed that he sustained internal injuries.

The start occurred at 1.29 P. M. At 1.48 came word from the monastery at the summit of the Simplon Pass that Chavez had passed above it at a height of 1,600 feet. At 2.19 P. M. the daring aviator landed at Domodossola, Italy, some 25 miles from Brig, after a long glide of 3,000 feet. Just before alighting, and when only about 30 feet from the ground, Chavez apparently started his motor again.

Weymann, the American aviator, in a Farman biplane, was the only competitor of Chavez, who actually made the attempt. He mounted to a high altitude several times, but was unable to reach a sufficient height, last Friday, to fly over the pass.

It was necessary for Chavez to attain a great altitude to clear the Simplon Pass, the summit of which rises 6,592 feet.

He maintained apparently this altitude, and followed over the road built by Napoleon in 1800 over the Simplon Pass. He accomplished the eight miles that brought him over the top of Simplon, and then sailed gracefully over the eighteen miles down to Domodossola.

Arriving at Domodossola, he had left the hardest part of his journey behind him, having escaped the high peaks and the jumble of rocky gorges on this side of the summit. The remaining distance to this city offers less difficulty, but takes the aviator over Lake Maggiore and a succession of plains to the goal.

The distance from Brig, Switzerland, to Milan is 93 miles by the course planned, and the prize was for the aviator who should make the first flight, starting from a tableland 900 feet above sea level at the head of the Rhone valley, near Brig, Switzerland. In addition to reaching a height that would bring him over the Simplon summit, and in doing which he must suffer severely from the cold, the aviator was required to guide his frail craft over wide chasms, notably the Gorge of Ysette, where a safe descent would be quite impossible, and an accident must mean almost certain death. Aviation experts had predicted freely that the only alternative to a successful flight across the Alps was the death of the aviator.

At the funeral floral tributes came from all parts of Europe, and thousands of peasants tramped down the mountain sides with arms filled with mountain flowers. One little girl laid upon the coffin a bunch of edelweiss that blooms alone amid the eternal snows of the Alps, bound with a ribbon on which she had written: "Gathered among the mountain peaks over which you flew."

LANDS IN STREET.

PARIS, Sept. 9.—For the first time in the history of flying an aeroplane alighted in a public square in Paris, and though it was severely damaged, the possibility of such an event was fully demonstrated. The aviator, Parisot, rose in a Farman biplane with a passenger from the maneuvring ground at Issy-les-Moulineaux, and, after circling the Eiffel Tower, steered his machine so as to come down in the Esplanade des Invalides. He had nearly landed when he was forced to turn sharply to the right in order to avoid some carts, with the result that he collided with two lamp posts, which badly damaged the machine. Pending the framing of a decree which shall be applicable to the whole of France, the French Aero Club, acting on the suggestion of the Prefect of Police in Paris, has undertaken to caution aviators against landing in towns or urban areas.

ROZOY, France, Sept. 12.—Michel Mahieu flew 3 hours with a passenger across country.

NEW RECORDS AT BORDEAUX MEET.

BORDEAUX, Sept. 18.—The last day of the meet saw several records fall. The new records are:

60 kil., 39 m. 32 2-5 s., by Morane.
70 kil., 46 m. 19 1-5 s., by Morane.
80 kil., 53 m. 5 s., by Morane.
90 kil., 59 m. 52 2-5 s., by Morane.
100 kil., 1 h. 6 m. 39 s., by Morane.
Record for 1 hour, 90 kil., by Morane.

Aubrun flew longest in one flight, 317 kil., in 3:15:30, on Sept. 16. Morane flew up to 2,100 m. (7,888 ft.).

DEATH OF POILLOT.

PARIS, Sept. 25.—In making his sixth flight of the day, with pupils, at the aviation school at Chartres, this morning, Edmond Poillot fell from a height of 90 feet. His backbone was broken, and he died in a few minutes without regaining consciousness. The passenger escaped with slight injuries. The aeroplane was a Savary.

200 MILES CROSS COUNTRY IN ONE DAY.

VINCENNES, Sept. 29.—Lieut. Bellenger, army officer, flew from the parade ground to inspect a suggested flying field at Sissone. From here he flew to Mourmelon in his army Bleriot, and visited with his friends. Towards evening he reascended for his return to Vincennes.

PLOCHMANN'S DEATH.

MUELHAUSEN, Germany, Sept. 29.—Plochmann, the aviator, who was injured when his biplane collapsed at a height of 150 feet, yesterday, died to-day without having recovered consciousness.

NEW WORLD HEIGHT RECORD.

MOURMELON, France, Oct. 1.—Henryk Wynmalen, the aviator, established a new world's record for altitude to-day, rising to a height of 9,186 feet.

The best previous mark, 8,403 feet, was made by the late George Chavez.

Wynmalen first attracted international attention on Sept. 29, when, at Bourg, he rose to a height of 7,954 feet.

19TH DEATH IN POWER MACHINES.

METZ, Germany, Oct. 1.—Aviator Haas fell and was instantly killed to-day while taking part in a distance competition from Treves to Metz.

Haas had covered about twelve miles when, from some cause yet unexplained, his machine dropped suddenly to earth in the village of Welle, on the Moselle river. The aeroplane was demolished.

It is a fact that the majority of deaths have been with biplanes.

COLLISION IN MID-AIR.

MILAN, Italy, Oct. 2.—The Antoinette of Thomas collided with the Farman of Captain Dixon in mid-air, smashing both machines. Thomas escaped serious injury, but Dickson sustained severe injuries.

(*Continued on page 188*)

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"No balloon was ever constructed or more handsomely designed than the 'BOSTON.'" ***Chas. J. Glidden.***

"Your balloon 'DELIGHT' is the finest piece of workmanship and grandest rider I have ever seen." ***Clifford B. Harmon.***

"Our 'PHILADELPHIA II' is a wonder. I have broken every record from this city and every member of our club congratulates you." ***Dr. Thos. E. Eldridge.***

"A STEVENS balloon every time for me." ***N. H. Arnold.***

"Our balloon has done wonderful work during its three years' service." ***Luke J. Minahan,*** Pres. Aero Club of Pittsfield.

"A more perfect balloon was never constructed than the 'PENNSYLVANIA I.'" ***Arthur Atherholt,*** Pres. Aero Club of Pennsylvania.

"I never fear traveling in the upper air in a STEVENS constructed balloon." ***David Todd,*** Prof. of Astronomy, Amherst College.

"A STEVENS balloon for me every time." ***Leroy M. Taylor.***

"My balloon 'DELIGHT' could not be bought for twice the price I paid for it." ***E. B. Weston,*** Dayton, O.

"The 'MICHIGAN' is the most perfect balloon I have ever seen." ***L. Metzger.***

"I admire the 'CLEVELAND' it is a perfect beauty and the 365 miles it carried me on proved its ability." ***H. Percy Sherman,*** Williams College, Williamstown, Mass.

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Pilot J. H. Wade, Jr., aide A. H. Morgan, 371 miles; duration, 37 hrs., 38 min.

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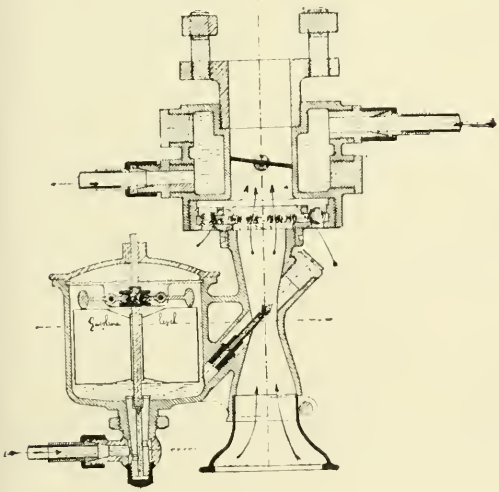
International Aeroplane Supply Co.

It is with much regret that AERONAUTICS was imposed upon to the extent of accepting an advertisement of the "International Aeroplane Supply Co.," of 1777 Broadway, New York. An advertising solicitor brought in the advertisement. Owing to pressure of business the contract was not verified, and the advertisement was inserted in the September number. A great mass of mail was the result. This solicitor represented himself to the agent of the building at 1777 Broadway as a member of this alleged company, and partially arranged for the renting of an office in the company's name. The agent turned over to the solicitor such mail matter addressed as had been received at the time.

Needless to say, the solicitor is not soliciting any more—at least, not for AERONAUTICS. If any money has been sent the matter should be taken up with the Postoffice Department.

Elbridge Co. Adopts G. & A. Carburetor.

The G. & A. Carburetor, controlled by A. J. Myers, 244 West 49th St., N. Y., has been adopted by the Elbridge Engine Co., as its work has been found most satisfactory on their two-cycle engines. The G. & A. carburetor is very flexible. A large number has been ordered by the United States government, after competitive tests on a



250 h. p., Jencick submarine engine. The speed range of the motor was from 90 to 1,200 revolutions. In another test, a National engine, could be slowed down to 70 revolutions. The G. & A. carburetor is the standard equipment on the Anzani and Otto engines, and the Aster, Aries, Adier, Delaunay, Westinghouse and other cars. It is also used by Santos-Dumont, Latham and Charles F. Willard.

Shelby Cold Drawn Steel Tubing.

Tubes for some few years have been used more or less as an experiment in aero work, but in the past two years there has been a widespread demand for them throughout the entire country on account of their special adaptability for this class of work that demands the maximum of strength with the minimum of weight.

The Peter A. Frasse Co. carry in their various warehouses in New York, Buffalo and Philadelphia, very large stocks, principally round sizes in from 1/16 in. OD to 5½ in. OD in various thicknesses of walls from 1/32 in. to ¾ in. Also carry a line of square sizes and some oval and rectangular shaped tubes.

They will exhibit at Belmont Park Meet October 22d to 30th, 1910, space No. 28.

Harkness Buys an Emerson.

Harry S. Harkness, who wishes it known that he is neither from California nor Cleveland, nor a millionaire, has a 150 h. p. six-cylinder, two-cycle Emerson engine in his shed at Mineola. Presumably he will use this engine in one of his Antoinettes.

W. L. Fairchild, another Emerson owner, has been making trials at Mineola with his monoplane, recently illustrated in AERONAUTICS. It is rumored that Curtiss is to try one of these engines. The Emerson engine is pronounced good even by competitors. Fairchild is enthusiastic over its performance.

Ball Bearings in Aeroplanes.

Here is a New Year resolution from the R. I. V. Co., of 1771 Broadway, New York.

"Showing the manufacturer and the individual buyer what a perfect ball-bearing is, looks like and works like; what precision in a ball-bearing means to every car, aeroplane or machinery owner, in dollars and cents, and what it means in reputation to a manufacturer of perfectly designed mechanism, cars or airships; of producing and marketing 'the best'; of backing up our claims by the fullest guarantee; of meeting our promises of delivery; of according the fullest business courtesy to customers and attention to orders; of generally increasing our business along the same conservative lines that has made R. I. V. respected, and of pleasing customers who appreciate quality, and conservatively extending credit of 10 to 30 days to those entitled to it."

Leading Vanderbilt Cars Carry Warner Auto-Meters.

The big Vanderbilt Automobile Cup Race proved another triumph for cars equipped with Warner auto-meters. Harry Grant's Alco, the winner, and the second, third and fourth cars carried Warners. One of the features of Grant's victory was his steady and consistent pace which was maintained from start to finish, giving him the new American road race average of 65 1/5 miles an hour. This steady pace is a silent testimonial of the value and accuracy of a Warner on a racing car.

The Warner also scored heavily in the Wheatly Hills and Massapequa races, the two minor events of the day. Eighty-three per cent. of the cars entered in the three races were equipped with Warners. The other 17 per cent. of the cars were divided among three other makes of speedometers. Every big race sees more Warners in use as they are the only speed indicators that can be depended upon by the big racing drivers.

Bicycle Champion Buys Aeroplane.

The Church Aeroplane Co., of Brooklyn, N. Y., is making a specialty of building complete aeroplanes, ready for the engine, both of standard designs, and built to order from working drawings furnished by their customers.

D. A. Kreamer, the ex-six day bicycle champion, has one of the Church biplanes, and has been making some very successful flights, towed by an automobile, and when 75 or 80 feet high, cutting loose and gliding several hundred feet to the ground.

Having gained considerable experience in handling the machine in this manner, he is now about ready to install an engine. The manufacturers received a very nice letter from Kreamer stating that he considered the workmanship to be very nearly perfect, and he was equally well pleased with their mahogany propeller built especially for his machine.

This company also built the Bleriot XI. monoplane, which is being used in James Montgomery's new play, "The Aviator." A monoplane similar to the Bleriot XI., but somewhat larger, is being built for Frederick Pearson, a Harvard student, and is now ready for the engine.

Another monoplane is under way for Mr. H. Wadsworth Longfellow of Boston, and will be on exhibition at the Boston February Show, and the manufacturers claim that this machine will be as well constructed and finished as the finest racing yacht.

The Church Aeroplane Co. is also prepared to furnish finished wood parts, such as struts, wingbars, ribs, skids, etc., either plain, laminated, or hollow, in clear spruce, white ash, mahogany and bass wood.

Also, cold rolled sheet steel fittings in drop-black, or nickle, and two types or aeroplane wheels.

They are handling the high grade "Paragon" propellers exclusively, and soon expect to have several of these on exhibition at their new factory, 123 Smith St., Brooklyn, N. Y.

This company has built a great many models of various types, some of them being furnished to the Harvard Aeronautic Society, Cleveland Aeronautic Society, Boston Y. M. C. A. Society, the International School of Aeronautics, etc., as well as the five foot model of the "Curtiss Albany-New York Flier," which the New York World now has on exhibition in the rotunda of the Pulitzer building.

Complete parts of every description for model builders and experimenters are carried in stock, and the variety of such parts is continually being increased.

Plans are well under way for a new type of aeroplane, which the Church company is about to put on the market, and Mr. Church, who designed the machine, has termed it a "monobiplane." Complete details of construction are not ready for publication, but the manufacturers expect to have this ready in the very near future. It is claimed that the new combination skid and wheel alighting device will be constructed in such a manner that it will be able to start and alight on very rough ground. This machine will also have a front and rear control, and a new device for lateral stability which is designed to be about 75 per cent. automatic.

Enters Aeroplane Trade.

The J. I. Case Thrashing Machine Company will compete with the Mitchell-Lewis Motor Car Company in the manufacture of aeroplanes. It will begin immediately, under the personal supervision of Lewis Strang.

The New Fabric, "Penacloth."

The Pennsylvania Rubber Co. has been experimenting for several months to secure a satisfactory fabric, has thoroughly tested the material now offered and believes that it far surpasses anything which has been produced heretofore. It is proofed with rubber and colored yellow to protect the rubber from the injurious light rays. Tested for durability, it does not deteriorate in sunlight as most rubber coated fabrics do.

The weight of "Penacloth" is 6 1/3 ounces per square yard. This is an ounce or two heavier than most fabrics which are now in use, but as the strength is a very important consideration. The strength of this fabric is phenomenal for its weight, being 130 pounds per square inch.

There has been a number of accidents lately which could be attributed to the tearing of fabric on the planes and it therefore seems that most experimenters will be looking for a stronger material. A fabric of this strength will help to hold the structure together in the same way that bracing wires do.

The width of this fabric is 40 inches.

The advantages of a water-proofed fabric are that it protects the wooden frame work from dampness and will not stretch, or absorb moisture and thereby increase its weight in damp weather. The added weight of this fabric over the ordinary material is quite inconsiderable, adding only about seven pounds to the total of even the largest machine.

Roebling Exhibit at Belmont.

At the Belmont Park International Aviation Tournament, the John A. Roebling's Sons Company will show their standard aviator cord. Samples of all sizes of both single strands and flexible cord will be displayed.

Roebling plated aviator wire will also be exhibited in sizes ranging from No. 10, B. & S. gauge, weighing 2.91 pounds per 100 ft. down to No. 21 weighing .227 pounds per 100 ft.

Insulated wires for use in airships and automobiles and specially constructed light wire ropes designed for use as emergency brake cables for automobiles will form another detail of the exhibit.

"Camasco" Adopted for Trade Name.

The California Aero Mfg. & Supply Co. have adopted the trade mark Camasco from the initials of the firm name, which will be used hereafter as a trade name for the monoplane, biplane, propeller wheel and other aeronautic specialties manufactured.

They report that work on a number of machines being built to order has taxed their facilities so that their own type, of Camasco machines, a monoplane and a biplane, will not be on the market for a month. A pleasing feature, however, is that several deposits have been made on this type, merely on the class of work being turned out on the former. Full descriptions of those machines will appear in AERONAUTICS.

They report also the sale of a "Loose monoplane" to Mr. Ed. Smith of Stockton, Cal. The Loose Monoplane Co. has given them large orders for ribs, spruce and ash, in special shapes. That trade is not alone local, may be judged from the fact that shipments have just been made of Camasco knock down planes, to New Zealand and Nome, Alaska.

A large stock of models and model supplies will be shortly installed.

Their large show rooms at 441 and 443 Golden Gate Ave., San Francisco, could be termed a good sized aero show, four full sized machines being at present on exhibition. A "Greene" aeroplane, veteran of many flights, two Loose monoplanes and a Demoiselle type, besides several gliders, aero motors and a large number of propellers, accessories, etc.

A "Visitors Welcome" sign throngs the place from opening of doors. It is the meeting place of all the local aviators, and all visiting enthusiasts are cordially invited to make it their headquarters.

Agencies have been secured for Naiad cloth, all makes of aero tires, Detroit Aeroplane Co. and Michigan Airship Co. motors, Paraborel propellers, Roebling aero cord, and many other specialties.

"Caveat Emptor."

That there is a special need for knowing the exact horsepower capable of being developed by an aeroplane engine, while not so necessary in the automobile, is claimed by Joseph Tracy, whose engine testing device has been installed in many of the large automobile factories, such as the Atlas, Continental, Simplex, Winton, Mercer, Moline and others.

In one certain specific instance an aeroplane engine sale would have resulted in greater economy for the purchaser had such sale been contingent upon test by an apparatus like the Tracy Dynamometer. The old business motto "Caveat Emptor" (Let the buyer beware) still has worth, although generally business ethics of some big concerns have made it almost obsolete. There are bound to be misrepresentations perpetrated upon the unsuspecting purchaser of aeronautic material, and it is no great trouble to keep this little advice in mind.

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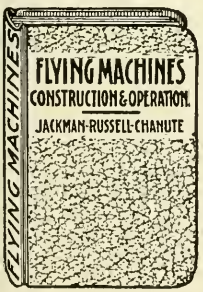

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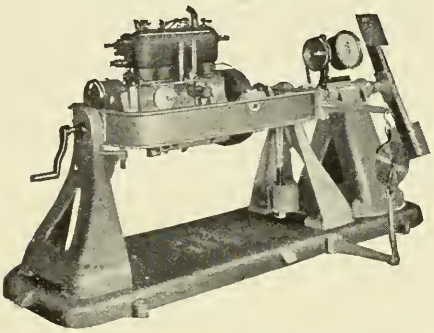

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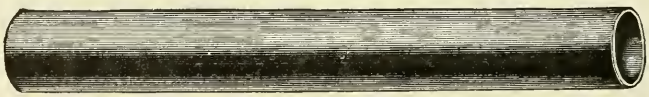

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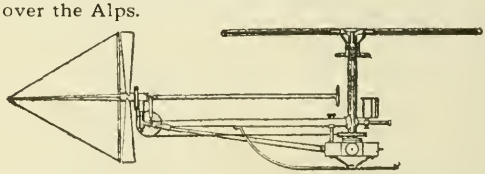

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Biggest Propeller a Gibson.

The largest propeller ever made has been turned ut by the Requa-Gibson Co. for a monster 2,200 ound aeroplane building in California. It is 14½ t. in diameter.

A conversation with Mr. Gibson on various subects relating to propellers brought out the folowing statement:

"We are employing a large force of men, specialists in this work, and by the use of many pecial devices, instruments, etc., combined with he extreme accuracy, resulting from our special rocess of manufacture, we succeeded in producing ropellers, which were so accurate as to cause emarks from some purchasers, who have taken he trouble to check up the characteristics of the ropeller, and compared them with the markings n the same propellers, and have found them orrect in every instance. This is a very great hing to say.

"By the usual process of elimination we have esolved not to cater to the light weight craze. t costs the purchaser too much money, and the alue of this course is shown in the fact that ight out of ten accidents, such as striking stones, ticks, wires, etc., do ruin an ordinary propeller, ut are not sufficient to put ours out of business. Ve can repair them in a perfectly satisfactory ianner. France has shown America the way in ie building of automobiles, and so it is doing i aeroplane building. We, for our part, are willig to be shown, in some respect at least, especially i regard to finishing.

"We realize how much efficiency is lost by caress and incompetent finishing, and after spending onsiderable sums in securing the best possible esults, our propellers have the appearance of beig finished in a piano factory.

"We propose in 1911 to continue improving, id as we have been in the lead in this country i the past, so we propose to be in the future, nd our reason for this optimism lies in the niversal satisfaction so unstintingly expressed by very one of our customers except upon one oint, delivery.

"Let this be our explanation and apology. We 'e endeavoring to produce the best, and having one so, we will in the natural course of events ' rewarded by the support of those who appreiate that America to be in the lead must take ist as much pains as our foreign competitors."

No Change in Naiad Cloth.

The C. E. Conover Co. at present do not exect to make any change in their cloth, as the ind they are now selling has proved so satisactory they do not think it necessary to make ny change. Among the manufacturers and others ho have bought their cloth extensively are the ollowing:

Aerial Navigation Co. of America, Aeronautical uppiy Co., Auto & Aeronautic Supply Co., Caliornia Aero Supply Co., Hamilton Aero Mfg. Co., . & A. Wittemann, P. Brauner & Co., Burgess Co Curtis, Detroit Aeroplane Co., Elbridge Engine o., Harvard Aeronautical Society, Scientific Aeroane Co., Fred Schneider, Glenn H. Curtiss, Dr. . W. Walden, Chas. J. Strobel, H. C. Gammeter, . W. Gill, Chas. K. Hamilton.

Loose Monoplanes.

The Loose Monoplane Co. believes that for the resent and for some time to come the machine hich is and will be in the greatest demand is ne small monoplane to carry one person. The oose monoplane is built ready for the motor nd propeller. It is designed to carry 5 pounds er square foot, but is only called upon to carry pounds per square foot. Not so large that it equires a 50 foot hangar to house it in and not small that the aviator is crowded and uncomortable while in flight. It is a matter of less han half an hour for one man to remove the lanes after which it can be housed in a hangar feet wide by 25 feet long. In short the oose monoplane is in a distinct class by itself—a achine larger than the "Demoiselle" and smaller han the "Antoinette," designed to fly with about

160 pounds thrust from a motor of 20 to 30 horsepower.

The fuselage is of triangular construction, making the most rigid machine of this type that could possibly be built. Oak, spruce, and ash are used besides steel tubing, making a machine of durability. It has also been kept to the acme of simplicity throughout and where the vibration of the motor has a tendency to loosen a nut there are split pins, making reliability a third point in the construction. A big skid track is of great benefit in landing by keeping the planes well off the ground.

One of these machines has been purchased by E. H. Smith of Stockton, Cal., who has ordered a 20-30 opposed Detroit motor.

Hartford Tires Have Big Demand.

It is surprising, even to aeronautical publishers, to learn that it is not uncommon for the Hartford Rubber Works Co. to receive several orders for 50 to 100 pairs of aeroplane tires at one time, but such is the statement made by this company whose patrons include Wright Bros., Curtiss, Hamilton, Johnstone, Willard, Burgess, Brookins, Curzon and others. The line for 1911, which includes the single tube tires, Aviator, Aeroplane and Aeronaut brands, will not be changed.

Ferdinand Bayer, 104 West Main St., Gainesville, Fla., wants to correspond with manufacturers of and dealers in materials for construction of aeroplanes, airships, etc.; material to include steel, aluminum and engines.

First 1911 Elbridge.

The first 1911 Elbridge engine has been assembled and it was found to weigh, with all required fittings, 155 pounds for 40 horse power rating. It is expected that the engine will give at least 10 per cent. more power.

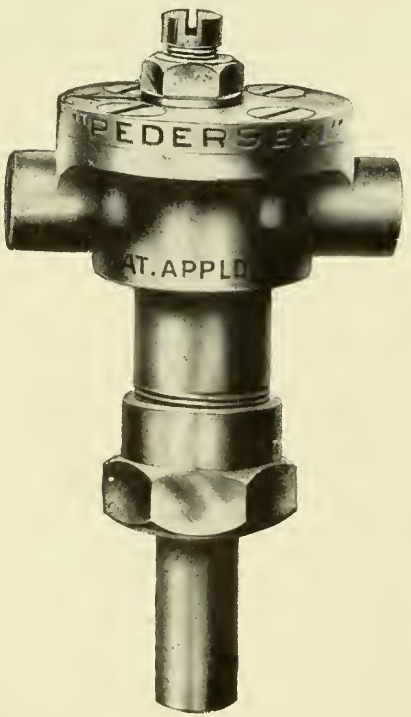
A very large percentage of the successful flights by novices during the past month were made with Elbridge engines. On one day at Mineola recently with five men in the air, three of them were flying with Elbridge engines. A partial list of the men who have made flights at Mineola this summer with Elbridge engines shows that the trick has been done by Dr. William Greene, J. J. Frisbie, Bud Gaskell, George Russell, F. E. De Murias, Joe Seymour, Henry C. Cooke, Charles Willard, Chester Kaufman, Wilson Post and others. The distances varied from try-out jumps of a few hundred yards to cross-country flights of many miles.

New Rotary Oil Pump.

The Pedersen Manufacturing Company, 644 First Avenue, New York, besides their well known mechanical lubribators, are now offering a new small rotary oil pump, that on account of its small size and light weight is especially adapted for aeroplane engines. The construction of this pump is very simple, consisting of only two moving parts, but the pump has considerable lifting and discharge power.

Several types of these pumps are made, the one illustrated in full size being the No. 2 pump, which has means for regulating the amount of oil pumped, so that this pump in itself constitutes a complete regulatable oiling device.

This pump consists of a casing with an enlarged end bore, a shaft fitting in same and having a cross slot at its largest diameter, in which slot fits a piston or slide, with lugs on each end. In rotating the shaft, the slide rotates with same, and the lugs by coming in contact with the taper screw placed eccentric in the head or cover of the case is given a lengthwise movement in the slot. The regulation is obtained by varying this movement, which is accomplished by the taper screw, as when this screw is at its extreme inward position the slide has its greatest movement, and vice versa.



The movement of the slide takes place when it is opposite the suction and discharge ports, and as the movement is toward the outlet port, oil is drawn in at the suction side, and confined between the wall and the piston during the rotation. When the reverse movement of the slide takes place, this oil is forced out through the discharge port, and at the same time a new charge is taken in at the suction end. This is repeated as the shaft revolves.

These pumps can also be used in connection with single or multiple sight feeds.

New Bretz Office.

The J. S. Bretz Company have just opened up a complete western office and salesroom at No. 121 Woodward Avenue, Detroit, Mich. The suite of offices occupies the whole of the second floor of a new two story brick, stone and plate glass building that was erected especially for automobile use in the heart of the automobile district. H. J. Porter and J. W. Hertzler, the western sales representative of the J. S. Bretz Company, will make their headquarters at the new address, and show a complete line of F. & S. Annular ball bearings, German steel balls, U. & H. master magnetos, and Bowden wire.

Bosch Magnetos at Berlin.

In the Berlin aviation meeting held last August Bosch magnetos were used on 27 machines, including Farman, Sommer, Wright, Euler, Grade, Farman, Aviatik, Voisin, Antoinette and Behrend. Six different types of Bosch magnetos were employed. There are still two more types used in aeronauti work.

AERONAUTICS AND WAR

[*Continued from page 146*]

making such a vessel, practically as they do to-day, silk, linen and cotton cloths, goldbeater's skin, linseed oil and even solution of rubber. Attempts, however, to make balloons for the purpose of demonstrating in the lecture room the lightness of the gas proved failures. Seventeen years after this important discovery of hydrogen, it remained for Montgolfier, in 1782, to be the first to bring about that collocation of materials necessary for a successful balloon.

Montgolfier began his experiments by using hydrogen as the lifting power. This he inclosed in small silk bags and in small thin paper bags, which easily rose to the ceiling and higher, but which would remain in the air but a very short time owing to the porous character of the materials used in their construction.

Had Montgolfier at this stage turned his attention to the question of making the envelope impervious, as was afterwards done by Charles and Robert, he would have produced then and there the balloon. But instead of doing this, he sought for a new lifting power, and he turned his attention to smoke. During a visit to Avignon he procured a silk bag of about 40 cu. ft. capacity and upon burning paper in the mouth of this bag, when inverted, it rose rapidly to a height of about 75 feet.

[*To be continued*]

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MAN WITH EXPERIENCE in heavy gliding models would like position with reliable parties in aeronautics. Valuable lateral stability device as an inducement for good position. Wesley Emmes, L. B. 37, Peterboro, N. H.

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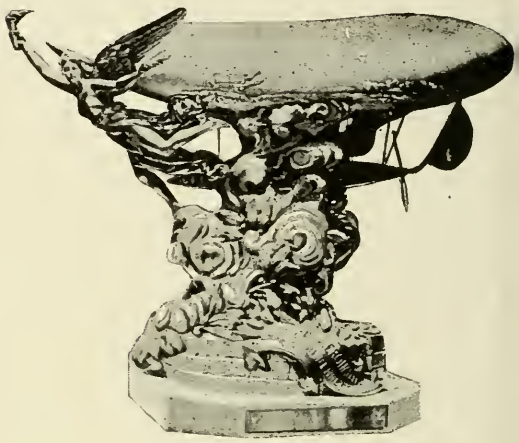
¶For the purpose of increasing the sphere of usefulness the membership should be augmented. Every additional member advances the general good.

Address the Secretary for booklet and application blanks at P.O. Box 28, Station D, New York; or 1999 Broadway, where weekly meetings are held.

¶The Aeronautical Society offers the courtesy of its grounds at Garden City, L. I., to all who are desirous of qualifying for pilots' licenses of the American Aeronautical Federation. Write directly to Secretary, American Aeronautical Federation, 170 Broadway, N. Y. City.

CLUB NEWS



Gordon Bennett Balloon Trophy

The **United States Aeronautical Reserve** is the latest aero organization, and it bids fair to rapidly become the greatest in this country.

Since the actual recruiting work began at the Boston meet 3,200 citizens joined the association, so it has been announced.

It was started by John Barry Ryan. The Reserve is planned to be a nation-wide association of aeroplane inventors, professional and amateur aviators, designers and builders of aeroplane engines and other aerial equipment, army and navy officials prominent in the regular service and in the militia of the states, financiers, statesmen, newspaper men, sportsmen, and hundreds of others interested in aeronautics, from President Taft down to the humblest aeroplane mechanic—and all banded together to advance the aeroplane as a war engine, to make of it something better than a mere exhibition toy, and of its aviators something besides air chasers of prize money.

There will be captains for each of the states and territories in the Union.

Headquarters have been arranged by Mr. Ryan in the old Lenox mansion, northeast corner of Fifth avenue and Twelfth street, New York, which is being overhauled and refitted for the purpose.

One important feature will be the library. It is planned to have as complete a library of old and current books and journals and data of all kinds as is possible—something needed greatly in this country.

It is expected to swell the membership to 50,000 members by January 1st.

The qualifications necessary to membership are: active member, viz.: Any aviator qualified as such, initiation fee one dollar, annual dues two dollars; apprentice member, any individual interested in aviation, initiation fee one dollar, annual dues one dollar.

For further information address Richard R. Sinclair, general secretary, 53 Fifth avenue, New York.

The **National Association for the Promotion of Military Aeronautics,** formed in Washington, D. C., some weeks ago among officers of the National Guard of the District of Columbia, by Captain Charles J. Fox, commanding First Battery, Field Artillery, N. G. D. C., has discontinued its existence as an organization and its members have joined the United States Aeronautical Reserve. The association was formed along the lines of the National Association for the Promotion of Rifle Practice, and its object was to promote aeronautics as a branch of military science.

Many officers of the National Guard of the District had joined the association and it was planned to make it national in scope, with Washington as

a headquarters and a national aerial maneuver ground and camp of instruction in aeronautics at College Park.

When Commodore John Barry Ryan, of the United States Aeronautical Reserve visited Washington and succeeded in actively interesting officers of the Army and Navy, in his national organization, the members of the Washington association, at a special meeting, decided that they could best promote the objects of the National Association for the Promotion of Military Aeronautics, by joining the larger body.

Captain Fox called upon Commodore Ryan in Washington, and the organizer of the United States Aeronautical Reserve said he would welcome the District Guardsmen in the Reserve.

A large number of officers and enlisted men of the National Guard of the District of Columbia have joined the Reserve, and they hope to establish at the National capital an aerial manœuver ground, where experiments in aerial tactics can be worked out.

Prominent among the District Guardsmen, who joined the Reserve, is Colonel Charles H. Ourand, commanding the First Infantry, N. G. D. C., who years ago drew many of the designs for the machines used by Professor Langley in his experiments on the Potomac in mechanical flight.

The **Aero Club of St. Charles College** has been formed at Helena, Mont., where Mars has been flying. J. C. Mars was elected president.

The **Aeronautical Society** was addressed by its president, Hudson Maxim, on Oct. 13th, the subject being "Some New Discoveries in the Constitution and Dynamics of Language." L. E. Dare gave his experiences during his tour with a model exhibition over the country.

On Sept. 22, Lieut. Frederick E. Humphrey, late of the U. S. Signal Corps, lectured on the subject of "The Value of the Aeroplane to the Signal Corps in Time of War."

The **New Jersey Aeronautical League** has been started at the Guttenberg race track, N. J., for the promotion of aeronautics in that state, by about thirty members.

At the last meeting about ten more members were proposed. There was a model aeroplane exhibition at the Guttenberg Motordrome, under the auspices of the League on October 4th.

The officers of the League are as follows: Mr. A. Ermetti, president; Mr. C. Christianson, vice-president; Mr. J. E. Ring, treasurer; Mr. W. A. Kraus, secretary.

ASCENSIONS.

ALTON, Mo., Sept. 27.—John Berry, George S. Milnor and Miss A. Lanzwith made an ascent. After making an intermediate landing Berry took up five children.

TOPEKA, Kan., Sept. 30.—The balloon Topeka made a short flight, reaching an altitude of 8,200 feet, and landing at Meriden, 12 miles away. E. S. Cole acted as pilot and H. W. Jacobs, president of the Western Aero Club, made his initial flight.

HAMILTON, O., Sept. 28.—The balloon Drifter, with Albert B. Holz of the Holz Balloon Company, Cincinnati, as pilot, and Louis and Charles Troutman of Hamilton as passengers, left its moorings on its eighth trip this morning at 10:45 o'clock.

DAYTON, O., Sept. 20.—E. B. Weston, pilot, Leo Stevens and Clifford B. Harmon, passengers, started from Buck Island at 11:40 A. M. and landed at 5 o'clock at Washington Court House, Rattlesnake Gulch.

DAYTON, O., Sept. 22.—Another ascension was made on Thursday in the balloon "Cleveland," Leo. Stevens, pilot. Passengers, E. B. Weston, O. J. Needham, Dr. J. C. Eberhardt, and Dr. L. E. Custer.

Mrs. C. B. Harmon acted as pilot in the "Delight," Mr. Weston's balloon, with Ralph Devoe and Mr. Harmon passengers. Both balloons landed about 25 miles from Dayton, at Clinton, O., and both covered about the same distance in the time space of 3 hours.

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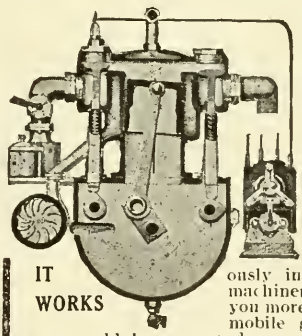

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CROSS-COUNTRY, 175¾ miles in 5 hrs. 51 minutes, Walter Brookins (world record)

DURATION, 3 hours, 5 minutes, Ralph Johnstone

SLOW SPEED, 22.82 m. p. h., Walter Brookins (world record)

ACCURACY, 5 ft. 4 in. from mark, Ralph Johnstone (world record)

SHORT CIRCLE, 5½ secs., Walter Brookins (world record)

SUSTAINED CROSS-COUNTRY FLIGHT, 97 miles, Arch Hoxsey

BENZ car with **MEA,** winner in **Gaillon Hill Climb,** 97½ miles p. h., 8% grade

Standard High Tension Equipment of the German **Mercedes**

Marburg Brothers

1777 Broadway

New York

AVIATION WEEK

Space 26, Belmont Park Exhibition

ETEVE STABILIZER

(*Continued from page 151*)

The preliminary attempts were made in order to verify the equilibrium of the modified aeroplane, which machine was placed at the disposal of Captain Eteve by General Roques, engineer-director. After having made some flights at Pau in company with M. Tissandier, Captain Eteve, beginning with the 4th of May commenced operations, first demonstrating the correct operation of the stabilizer when running on the ground; next making flights of 500 and 600 metres with turns on the 7th of May, and following with flights of 3 and 10 minutes on the 9th. On this day, the fact that the ordinary Wright can be readily controlled, was demonstrated. The operation of the depression rudder was found to be considerably simplified, and in spite of the large surface of the depression rudder of the Wright machine, the stability was such that the apparatus frequently remained in equilibrium for some minutes without the intervention of the pilot.

On the 12th and 13th flights of 31 and 17 minutes duration were made, and on the latter day a height of 30 metres with a figure 8 turne was attained. On the following day an 18-minute flight outside of the Saint-Cyr polygon, while on the 20th a flight of 8 minutes with the apparatus out of transverse equilibrium was made.

FOREIGN LETTERS

(*Continued from page 180*)

MORANE HAS ACCIDENT.

PARIS, Oct. 5.—Leon Morane, with his brother Robert as a passenger, attempted to win the Michelin prize of $20,000 for a two-man flight from Paris to Puy-de-Dome, a mountain 4,800 feet high, near Clermont-Ferrand, but fell near Boissy and broke one leg. His brother was badly injured. The machine was a 100 h. p. Bleriot.

FLEW 261 MILES CROSS COUNTRY IN 5 HOURS.

Henry Weymann, the American aviator, on Sept. 7 nearly won the prize. He got within 12 miles of the finish when the time limit was up. Several landings were made, and his journal lasted in all 7 hours, of which he was actually flying 5 hours 1 min., maintaining an average speed of 40.8 m. p. h., in his Farman machine. A record for cross-country flying in one day, for either one or two men.

The conditions of the prize demand the trip to be made in 6 hours, alighting on top of the mountain after circling the cathedral of Clermont-Ferrand, 5 miles from the mountain.

ARMY OFFICER DIES IN AEROPLANE.

ST. PETERSBURG, Oct. 7.—Capt. Macievich, the Russian military aviator, was killed in a fall from a ~~Voisin~~ biplane. The accident occurred during an altitude competition, which was won by Lieut. Matyevich, who reached a height of 3,937 feet.

Macievich had risen 3,930 feet, but decided to descend. When at a height of 1,640 feet his machine suddenly upset, and the aviator was thrown out. Every bone in his body was broken with the exception of an arm. It is the belief of physicians that he died of heart failure before reaching the ground. Loss of control of a lever is supposed to have been responsible for the accident.

It is reported that 120 Blerlot aeroplanes have been ordered by the French government.

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Edited by
E. PERCY NOEL
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Signed articles by aeroplane, dirigible and spherical pilots appear from time to time.

People having things for sale, such as second hand motors, aeroplanes, as well as those wishing to buy a bargain; men wanting positions, employers seeking men and a dozen other wants are included in the Classified Want Section each week.

AERO is endorsed by leading aviators and aeronauts, clubs, societies and manufacturers in this country and abroad, and those who are now reading it wonder how they ever got along without it. You cannot afford to miss it another week. The next issue may contain just the information you want now.

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ON account of the postponement of the International Meet and the subsequent conflict of dates, the THREE-STATES AERO SHOW, announced to be held in Philadelphia, October 22nd-November 5th, will be held November 2nd-12th inclusive.

As this is only ten days instead of two weeks, prices of floor space have been reduced 25%. Attractive subdivisions can now be made and arrangements closed for showing small exhibits at low prices.

For all information, address the manager

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Special Aeroplane Types

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BY using a special metal for certain parts of this magneto, the weight has been materially reduced without sacrificing in the slightest degree the vital element of safety.

THE Simms Aero-Type Magneto is used and highly endorsed by the most famous European aviators. Read this testimonial from Mr. J. T. C. Moore-Brabazon, winner of this year's Michelin Cup.

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WILL last from five to six times as long as a varnished balloon. The weight is always the same, as it does not require further treatment. Heat and cold have no effect on it, and ascensions can be made as well at zero weather as in the summer time. The chemical action of oxygen has not the same detrimental effect on it as it has on a varnished material. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the strength of varnished material. A man can take care of his PROOF balloon, as it requires little or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 lbs. per inch width. Very elastic. Any weight, width or color. Will not crack. Waterproof. No talcum powder. No revarnishing. The coming balloon material, and which, through its superior qualities, and being an absolute gas holder, is bound to take the place of varnished material. The man that wants to have the up-to-date balloon must use VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

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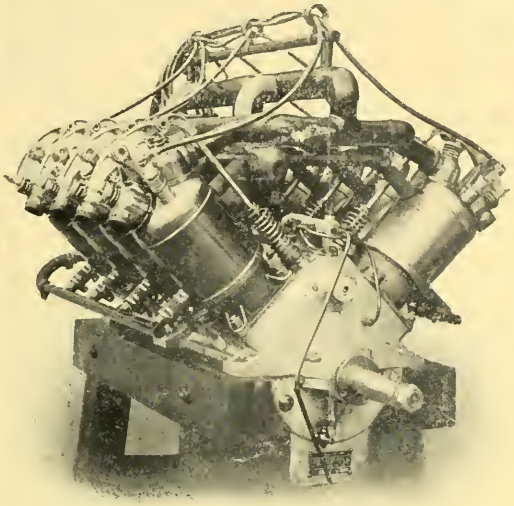

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FLEW On first attempt, making a complete circuit of the Aviation Field, at an average height of from 75 to 100 feet. The aeroplane was of the Farman type, and the speed estimated was about 40 miles per hour. Mr. Wilcox has since been making almost daily flights, duplicating the above.

RINEK Engines have within the past month or so come rapidly to the fore, and are to-day admitted by experts as second to none for aviation.

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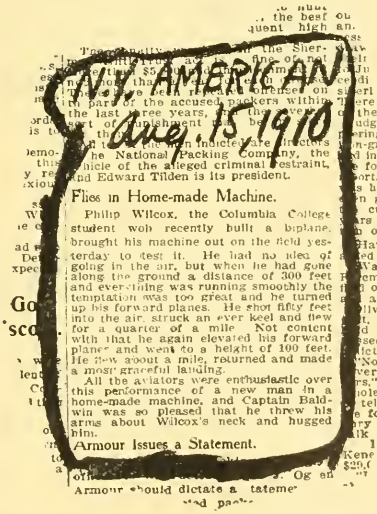
N.Y. AMERICAN
Aug. 15, 1910

Flies in Home-made Machine.

Philip Wilcox, the Columbia College student who recently built a biplane, brought his machine out on the field yesterday to test it. He had no idea of going in the air, but when he had gone along the ground a distance of 300 feet and everything was running smoothly the temptation was too great and he turned up his forward planes. He shot fifty feet into the air, struck an even keel and flew for a quarter of a mile. Not content with that he again elevated his forward planes and went to a height of 100 feet. He flew about a mile, returned and made a most graceful landing.

All the aviators were enthusiastic over this performance of a new man in a home-made machine, and Captain Baldwin was so pleased that he threw his arms about Wilcox's neck and hugged him.

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TYPE B-8, 60 H. P., weight, 275 lbs. complete
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Vol. VII DECEMBER, 1910 No. 6

AERONAUTICS

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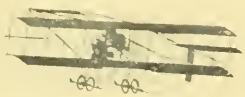

WILLIAM EVANS OF KANSAS CITY—In Greene Biplane With Elbridge Engine

ter practising one day Evans made a public flight of nearly 30 miles cross country from Overland Park. Two weeks later he entered a match race against Captain Baldwin for a purse offered by the Kansas City "Post." Evans' is the longest flight ever made by a novice.

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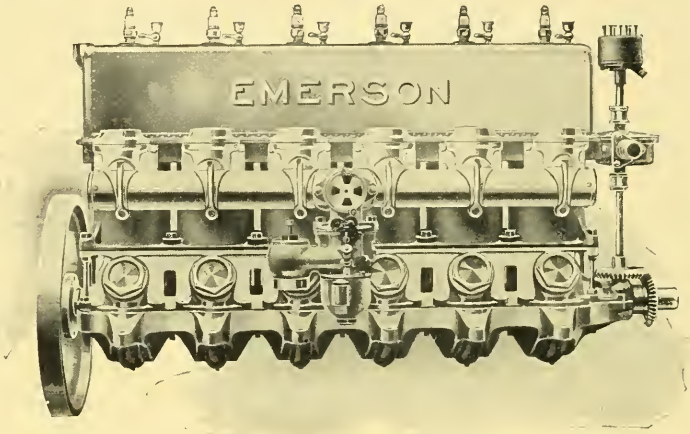

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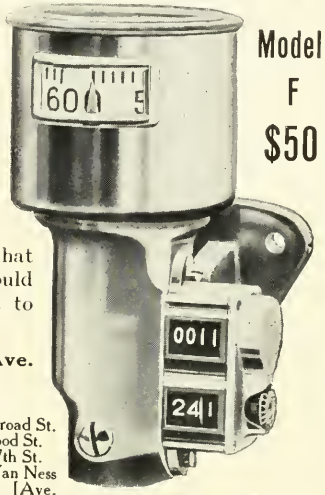

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OCT. 30-1910- INTERNATIONAL AVIATION MEET.

The Gordon-Bennett Cup was won by Grahame-White. The fastest time was made b Le Blanc, both in Bosch Equipped Bleriots. Hamilton's Hamiltonian and Latham's Antoinett are also Bosch Equipped. All Curtiss and Curtiss type, all Bleriots, the Farmans, th Demoiselles and Latham's 50 H. P. at the International Meet used Bosch Magnetos.

Vol. VII.

Aeronautics

No. 6

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AERONAUTICS AND WAR

By Lieut.-Col. W. A. Glassford.

SIGNAL CORPS, U. S. ARMY.

(*Continued from the November number*)

The success of this experiment induced ontgolfier to repeat it on a much larger ale, and on returning home to Annonay he onstructed a large globular envelope of coarse ien, lined with paper, and about 30 ft. in ameter. On burning chopped straw within is envelope it swelled and exerted a lifting ower of several hundred pounds.

A short time after this experiment a public hibition of its power was given on the 5th June, 1783, on which occasion the balloon se to an elevation of more than a mile, but mained in the air for a few minutes only, scending gently to the earth about a mile and e-half from the place of ascension.

The particulars of this experiment soon ached Paris, where a few persons became ger to repeat it. A subscription was raised defray the expenses and the construction a balloon was confided to the brothers obert under the supervision of Professor harles. It was at first intended to imitate roughout the experiment at Annonay, but rofessor Charles advocated the use of hydro-n, which, of course, necessitated an imper-ous envelope. The brothers Robert had al-ady been experimenting with solutions of outchouc for making cloth impermeable and is was used on the present occasion to render e envelope capable of holding the gas.

The balloon was a small one of about 13 ft. diameter. It rose from the Champ de Mars ig. 27, 1783, surrounded by innumerable spec-ors, to a height of 3,000 ft., and remained in e air for three-quarters of an hour, settling the earth in a field about 15 miles from aris, where the peasants of Gonesse, who ok it for a monstrous and diabolical animal, ached it with shotguns and pitchforks. Ac-rding to the local priest its wounded body haled a nauseous and characteristic odor. ie collapsed bag was finally tied to the tail a horse and dragged over the roads until ere was nothing left of it.

Among the enlightened people of the cities e enthusiasm was unbounded. Hundreds of ousands of people, undaunted by pouring in, flocked to witness, on a later occasion, e imposing spectacle of a globe rising in the in artificial flight and carrying passengers. ie first balloon to carry passengers was of e Montgolfier type and Pilatre de Rosier e first aeronaut. The general excitement soon had its effects on the fashions. Hats, both ladies' and gentlemen's, took the form of balloons, and garments in general followed suit, as far as compatible with the human shape.

Two kinds of balloons suddenly became practicable, each working on a somewhat different principle from the other. It is said that Montgolfier was not yet aware of the true principle of the ascensional force of his balloon. He seemed to think it was due to some kind of gas lighter than air which was generated by the fire; it was later that the true principle, viz., the expansion of air by heat, became understood.

The balloon soon assumed the shape of a sphere, on account of this form being that which gives the minimum weight of envelope for a given volume. Let us now consider for a moment this spherical balloon with hydrogen as the lifting power. We will suppose ourselves to be in the basket of a balloon and that we are ascending and drifting along in the atmosphere. As we go up, the air becomes lighter and there is less air above to press down, the pressure of the atmosphere becomes less and there is a corresponding expansion of the hydrogen in the balloon. The gas in the balloon, which follows the same laws as the air outside, expands correspondingly to the diminished pressure of the air, and if the balloon has been completely filled on starting, some of the gas must now escape, as otherwise, its expansion will soon cause the bag to burst through internal pressure, and then a catastrophe would be at hand. It is therefore customary to leave an opening in the lower part of the balloon for the escape of expanding gas. We are, then, losing gas as we rise and will continue to rise to a height where the weight of the balloon and what it carries equals the difference in the weights of the gas and of a bulk of air equal to that which the gas displaces. When we arrive at this point there is equilibrium, but only for a moment. We are now, so to speak, weighing ourselves in a balance more sensitive than that used in a chemical laboratory; but what with the defects of construction of the envelope and of the diffusion through the lower opening, the balloon is losing gas at all times. The balloon, therefore, now begins to sink and will continue to do so until we lighten it by throwing out

(*Continued on page 232*)

THE AEROPLANE ENGINE FOR 191

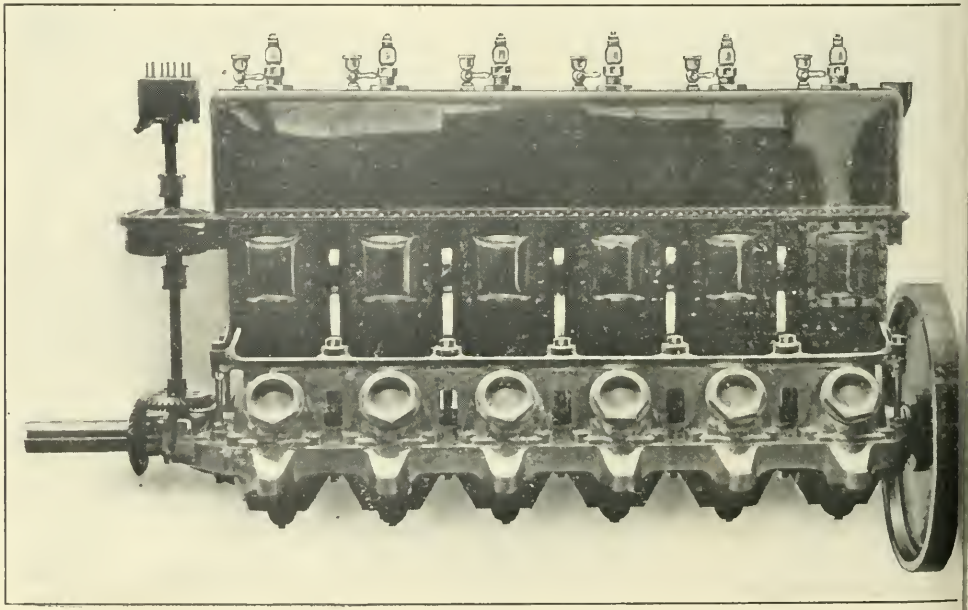
By Anthony H. Jannus.

IT is a great mistake in this age, when wonders develop into realities so quickly, to expect the ideal without giving the necessary time for development. This tendency is manifested by those seeking to solve their engine problem by searching the market for gas turbines, light and wonderful steam turbines, explosion engines using higher explosives than gasoline and the like. It seems reasonable to assume that the limitations of the present types of gasoline engines and the possibilities of better combining their acknowledged good qualities offer an extremely wide field to which many can turn who are expecting the undeveloped to blossom into instant utility. That it is possible better to combine the best in gas engine development should certainly be granted. The 4-cycle stationary cylinder engine is regarded as the height of conservative gas engine development Let us then consider those of its faults which are obviously remediable. The rotating cylinder engine has unquestionable merit, but by a comparison of the consumption of fuel, oil and labor necessary to keep the present very fragile specimens in good order, it does not yet seem to have solved the problem. It may well be said, to the detriment of the above statement, that the rotating cylinder engine, and one might as well say the Gnome, holds practically all records. This does not, however, prove it superior to the aeroplane engine of 1911 as you shall see. Neither would it be wise to predict the early defeat of the Gnome in aeroplane competition, with machines equipped with other engines, as much depends on the plane and operator.

A 4-cycle gas engine involves two valves for each cylinder, with at least one of these mechanically operated. These valves require the utmost consideration in the construction of cylinders, crank-case and water-jacket. In addition to this they must be driven and must not get out of adjustment. Obviously a steam engineer suggests ports as the simplest solution, but this also involves complications, not so much in constructing as in correct functioning. The valves must have seats, usually cast integral with the cylinder. They must not prevent too much of the head of the cylinder from being cooled and their springs and adjustments must be accessible. The operation of these valves must be accomplished with a shaft running only half as past as the engine and with attendant gears for this reduction in speed. These valves must, in their operation, have some retarding effect upon both the intake and the exhaust as they are invariably smaller than the diameter of the cylinder. The whole process of giving these valves time to perform their individual function must result in but one explosion to every four sweeps of the piston, making it necessary for the flywheel, or other cylinders, to hammer it back and forth for three cycles. The amount of power lost by this idleness for three cycles is only commensurate, however, with other losses in light, high speed, high-powered gas engines now doing active duty.

The lubrication of the best 4-cycle engines seen still to be quite a problem as the amount, quality and receptacle for the lubricant involves weight and usually apparatus, such as pumps, pipes and gages, which may get out of order. The irregularity of the pressure on the pistons during each of the four cycles involves much waste of oil during the three idle cycles (so called as they are not driving the shaft) to insure sufficient oil for the explosion cycle. This is so markedly evident in the rotating cylinder gas engine where centrifugal force magnifies oiling troubles, as to be chief among its disadvantages. A system of oiling that is directly dependent upon the fired mixture only, and not upon the number of revolutions of the engine, would seem a certain solution to this waste oil proposition, with its attendant carbon forming and ignition troubles.

Cooling by water has at present so many advantages over the air-cooling systems that it seems worthy of the most careful consideration. Many ingenious methods of jacketing cylinders have been devised such as the copper-jacket of the Cadillac automobile engine, the brazed jackets of the Curtiss aeroplane motor, and others, and many very difficult forms of cast jackets. All of these methods have had the valves as the chief obstacle in the road of uniform cooling of the cylinder wall and head. Where cast jackets are used great weight is involved in corners and crevices around the valves resulting in uneven temperatures of the valve seats and cylinder walls. A network of water pipes and joints is one of the most notionable things on an 8-cylinder "V" type engine and water leaks are also frequent. One jacket for (or for each group of four in the "V" type) would be the thing were it not for the valves and the difference in vibration of the cylinders. Tr



iis last objection could be overcome by casting ie cylinders en bloc, but that involves too much eight for the base and in the fillets at impossble corners of a cast jacket or too many leaks ound the valves of one that is fastened on. This, owever, would be ideal were it not for the valves, anifold, and the like.

The objections, briefly, to the accepted type of cycle stationary cylinder engine are air cooling ith its attendant reduction in power, the valves, e uneven torque, the oiling mechanism and reserirs, the uneven jacketing, and the weight and tricacy of pipes and joints for the water circuation. Nothing has been said of carburetion and nition as the development in these lines has been pid and consistent.

Now in crystalizing these criticisms of the obvisly defective into the ideal engine of 1911, the gine that is to be (and is) the logical developent of these observations of faults to be remedies may surprise you to know that a careful explaation of the engine in the engraving will be ough to convince you that theoretically the enie described should remedy these evils, and ive the proof of it to the performance of the gine in the last three months and in the years come. The engine before you has no valves xcept the auxiliary air valve of the stock Schebcarburetor) but has four ports which are capa- of functioning with greater economy of fuel d evenness of torque, at the one most efficient ed, in such a manner as to make the engine wer exceed that of its A. L. A. M. rating. The ial imperfect functioning of 2-cycle engines is logical result of endeavoring to make a port gine sufficient at any speed and is as imperfect 2-cycle engines as the set spark of 4-cycle enes, or set valves for variable speed steam enes. Although the ports are designed for effincy in fuel consumption and cut-off at, say, 00 r. p. m., the engine will keep running as w as 300 r. p. m. The waste of mixture at this w speed is great, but in aeroplane service one is oor operator indeed who can not use propellors table to the most efficient speed of the motor.

After citing so many obvious defects in the best ycle engines let us take a like view of the ditics, with which likely enough you are most miliar, and which we readily call to mind when ycle is mentioned to us. Until very recently collection of ports, carburetor, piston-rod and nk-shaft has been able to pass as a 2-cycle gine. As the price was low, and they would rk a motor-boat, thousands were sold. How ny of you can call to mind a 2-cycle engine h which you have had experience that emies the finest conceivable engine workmanship? comparison is rather that of a scow to a ing yacht. When you realize that the workmship on this engine of 1911 is as fine, and builder will tell you more, than that on any h-class, high-priced aeroplane engine in existe to-day, you must realize that this engine not be relegated to a place with cheap, crude ducts of the typical American small factory h but one type and one aim. Another reason the difference is that the designer and builder this engine also builds a record-breaking heavy y marine 4-cycle engine which will bear the est inspection in its class also.

Granting then the excellence in workmanship and ing aside all the prejudice which has been acnted for, let us study those things in the deh which make this engine the highest powered l most reliable motor in sight for 1911 aeroes. Speed being the cry, and high power essary to produce it, this engine seems to be best in the field.

he usual 2-cycle engine does one thing which esponsible for most of the lubrication troubles— cast a large by-pass on the side of the nder. The objections to this method are usutwo. The first reason is that this by-pass ssitates additional size to the base of the cylinand the crank-case, the sum total of a number ylinders being considerable weight and less base pression. The second and most important obion is that the mouth of the by-pass invariably is from a part of the crank-case well within field of the oil being splashed by the connectrod; hence every quick rush of gas from the to above the piston carries oil from the base re it is wanted to above the piston where it armful. A by-pass, then, that takes this comsed mixture from the base at a point sufficiently well removed from the splashing oil, would one of the greatest 2-cycle difficulties. This engine has a four-port system and two of these ports perform the duty of the old by-pass system. They are so arranged that the compressed mixture leaves from the side of the piston through a short 3 or 4 in. of aluminum by-pass to above the piston, having merely gone a distance equal to that part of the piston holding the rings. By examining the engraving of the engine you will see the aluminum plates on the side of the engine opposite the carburetor. Notice that this passage is well up from the crank and out of the range of splashed oil. In going through this passage another very desirable function is performed which is another exclusive feature of this new engine. The compressed gases, upon being released and going through the side of the piston, keep the piston cool. The nearest approach to this in other 2-cycle engines is the Whitehead motor where they have fallen from grace by resorting to a valve in the head of the piston.

After seeing that there is nothing unusual to remove oil from the crank-cases of this motor, let us turn to the method of getting the oil into them. It has already been suggested that a method involving no extra mechanism and which depended on the mixture used would be ideal. This is accomplished in this motor in a manner absolutely certain. The oil is mixed with the gasoline in the tank and all fuel and oil enter the engine through the spray nozzle of the carburetor, thence into a warm manifold. Entering as an atomized spray, the mixture is necessarily very cold, but three things occur which insure the gasoline remaining a vapor and the oil a liquid. The manifold is hot and receives this heat from the exhaust of the motor. The inlet port and exhaust port are separated only by a thin cast gray-iron wall, which heats the manifold, and against which the gas and oil strike in entering the crank-case. The separation of the gas and oil is further insured by the whirl that the gas makes in the crankcase, due to the motion of the crank, the change in direction it makes to get to the by-pass port, and the fact that the compression literally squeezes the oil out of the gas. Therefore the oil is practically poured into the crank-case and feeds a splash basin of the crank-case more surely than a mechanical oiler and with the additional advantage that if the process which brings it in does not occur, the engine would not run. This oil then lubricates the crank-shaft bearing, connecting rodbearing, and piston, just as in any splash system.

In addition to the cooling of the crank-case and piston by the incoming mixture the 1911 engine has a jacket through which a large rush of water can easily pass. The cylinders are cast en bloc, this method being the strongest for its weight when there are no valves or valve seats to consider. The side wall and head are entirely surrounded by water, except where spark-plug and pet-cock enter, and have more nearly even cooling from this than any other method affords and with less weight of jacket. The pump is put directly on one end of the cylinders and the discharge at the other without involving a single pipe in between. One might say that the cylinders near the pump would always be cool and those at the discharge end get only very hot water. This would be so with a small pump forcing water through intricate pipes and spaces, but where the water has an easy flow through large openings and is pumped at the rate of a barrel a minute (at 1,000 r. p. m. engine speed) the difference in temperature of the water from one end to the other is slight indeed.

A glance at the engine will easily reveal its great strength. Beside the block cylinders strapped together at the top, through the middle, and at the base, the two crank-case sections are beautifully ribbed and stiffened. The bolts that hold this crank-case together may be seen going from the bottom of the crank-case through the base of the cylinders, exerting a crushing strain on the aluminum. No one of these bolts has a thread in the aluminum and as they are of the finest steel and hand made nothing in light construction could be stronger.

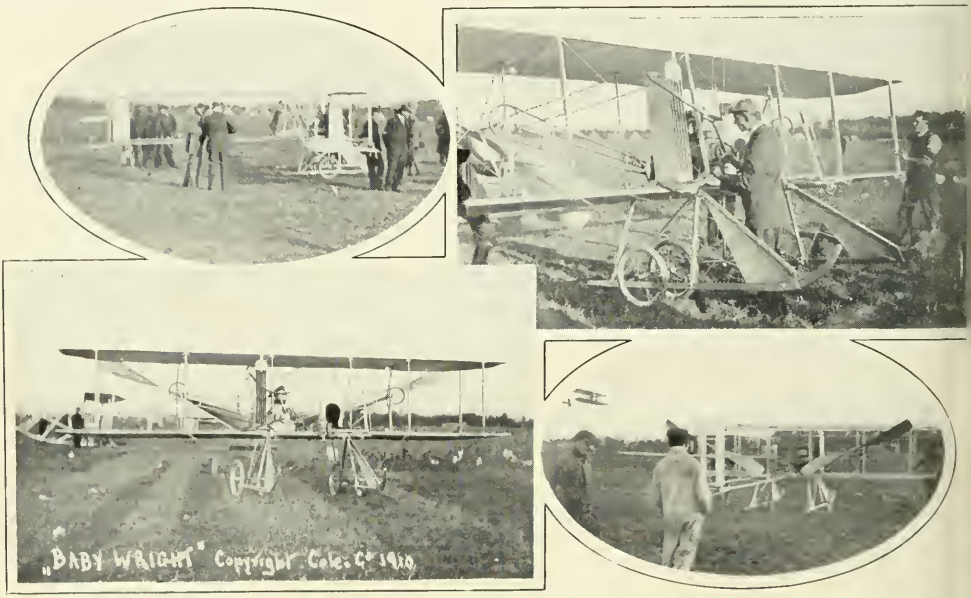
When you realize that there are six cylinders, 5 x 5 in., and that they each give an impulse every revolution you can begin to conceive the power possible from this engine. Six explosions to a revolution and each one as strong as the explosions in a 4-cycle cylinder. We may stop here and examine this statement—each explosion as strong as the explosion in a similar 4-cycle cylinder—and append it by saying that they are stronger, at the most efficient speed of the engine. In refutation many will say that the mixture is foul in a 2-cycle cylinder. One may answer this by saying the same of a 4-cycle cylinder, for the piston in a 4-cycle

engine can only scavange its own stroke, leaving the firing chamber full of the products of combustion. Who shall say that they have proved 4-cycle explosions stronger than 2-cycle when properly designed ports afford as good an opportunity for clean charge at one certain speed as a 4-cycle, bearing in mind that both are mixed with a slight residue? This continuous torque certainly does away with two idle cycles of the piston and keeps pressure always above the piston, preventing it from scraping oil from the wall of the cylinder on three strokes and burning it on the fourth. The increased efficiency of using the same pistons and crank oftener instead of carrying a greater number over two more cycles certainly seems to account for the enormous power of the 1911 engine. It would take 12 cylinders 5 x 5 in. in a 4-cycle engine to represent the same cylinder capacity. Such an engine would weigh so much as to be prohibitive in the present state of the art of flying as it would weigh 700 or 800 lbs. The equivalent in 2-cycle weighs but 286 lbs., with wires, spark-plugs and ignition system, and combines the ideal simplicity with great strength, needs no flywheel, no oil tanks or pumps or pipes or gages, and is most efficient at 1,000-1,200 r. p. m., which is a good speed for many excellent air propellers. The largest power in light engines suitable for aeroplanes seems to be the Gnome with 14 cylinders, 4.36 in. bore by 4.7 in. stroke, and is rated at 100 h. p. Recent articles in reliable publications seems to indicate that the engine develops less than its rated horse power, and this delicate and intricate mechanism weighs at least 280 lbs., consumes 4 litres (1.06 gal.) of expensive castor oil and "300 grammes o petrol per horse power and per hour," to quot the Gnome catalogue. This for 100 h. p. equal 9.46 gal. of gasoline and 1.06 gal. of oil, or ap proximately 10½ gal. of fuel and oil per hou for 100 h. p. or less.

As well in fuel consumption as in horse powe does the 1911 engine excel. The engine will tes above 140 h. p., but is modestly rated at 100-12 h. p., and when delivering 100 h. p. uses 6.1 ga of mixed oil and gasoline per hour, making but 23 grammes per horsepower per hour consumptio for an engine capable of delivering 125 h. p. an better.

A good comparison between the engine of 191 and the Gnome, its nearest competitor, is that o the French locomotive and its American equiva lent. Wonder at the workmanship and elaborate ness of small parts is inspired by all French ma chinery, but of what avail when competing wit an engine void of small parts and as exquisitel executed?

The extreme lightness of this large engine ma not appeal to that class of experimenters wh believe that aeroplanes should be built upon th argument "that a stone can be thrown farthe than a feather, the heavier the aeroplane the be ter." Nevertheless there are those who readil realize that aeroplanes must be designed for engin and propellors for the combination and it is to th class that 125 h. p. and a weight of 350 lbs. fo engine, radiator, water, and propellor will appea especially when combining the best in conservati engine practice.



SOME NOTES ON THE NEW WRIGHT MACHINE

WITH the expectancy of keeping the Gordon Bennett aviation trophy in America, the Wright company built a special machine, capable of flying 80 miles an hour. A private trial fully justified expectations based on design. This followed closely regulation Wright lines, except in size, weight, absence of passenger's seat and running gear. Following are the only correct figures published:

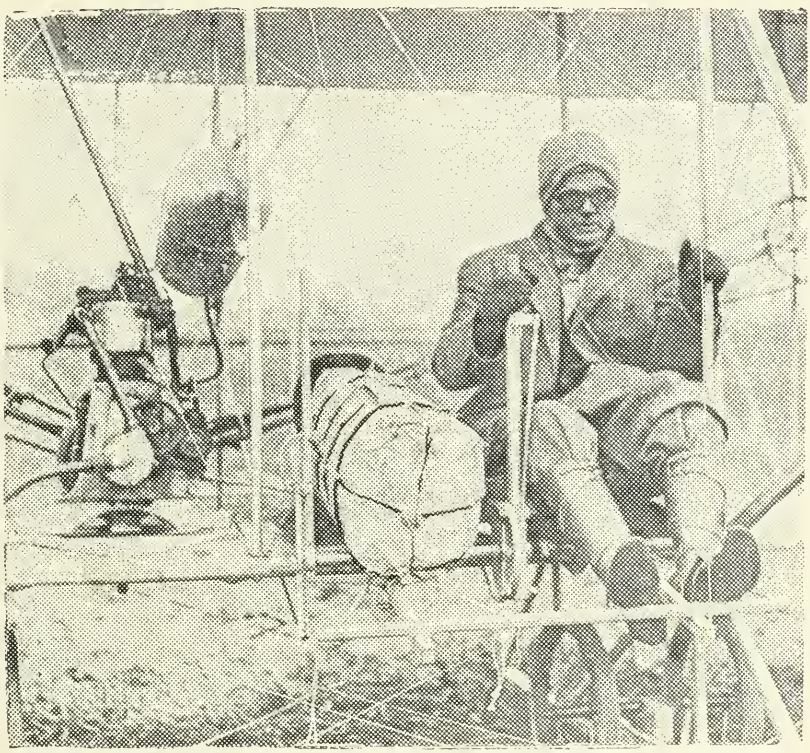
The spread was 22 ft., the main planes 3½ ft. fore and aft. The actual supporting surface of the two main planes totaled but 145 sq. ft. Eight of the regulation cylinders, which are now 4¾-in. bore by 4-in. stroke, were arranged on a special crank case. The A. L. A. M. rating would be 61.2 h. p. The weight of the machine was 780 lbs. without the operator. The combination warping and rudder lever was at the aviator's left, the elevator rudder at the right hand. The outriggers and tail were the same as on the standard 39-ft. machines. There was, of course, no front elevator, as all machines now being made have this at the extreme rear. It was, in fact, a duplicate of t other 22-ft. machines, except for motor and ru ning gear. Besides the regulation four whee mounted with rubber bands two to each sk there were two additional wheels mounted on axle fastened at each end to the front ends the curved skids.

There were at Belmont two more 22-ft. m chines, with the standard 30.6-h. p. (A. L. A. M motor, of 4 cylinders. These weighed 610 lbs. wit out the aviator, who added another 150 lbs. Bo of these warped and steered right and left by t leftthand lever, as Brookins is used to that positi for this lever.

The third machine of small size had a spread 27 ft. 7 in., the other dimensions of the plan being the same as the ones mentioned abov This was known as the altitude machine and w used by Johnstone at Belmont and by Hoxs at Baltimore. The warping lever on this machi was at the right hand.

(*Continued on page 232*)

FLIGHT PROGRESS ABOUT THE COUNTRY



P. O. Parmalee's Express

Parmalee Starts Aero Freight Line.

Fastest Speed for American Machines.

For the first time in aviation history an article of trade has been transported via aeroplane from one city to another. On November 7, P. O. Parmalee, in his Wright biplane, similar to those made for the general public, carried 10 bolts of silk weighing 70 lbs. from Simms Station, near Dayton, to Columbus, the consignee and backer of the enterprise being the Morehouse-Martens Co., dry goods merchants of Columbus. The distance by air line is 58.3 miles, and the time for the trip, with a wind of 5 to 7 miles an hour (on the ground) was 59 min., an average speed of 59.3 miles per hour. The value of the goods transported was $600. The Wright Company, acting as the "common carrier," applied their established tariff of $71.42 per pound. The grocer and baker have not as yet taken up the new rapid delivery.

The aeroplane left Simms Station at 10.41 A. M., passed South Charleston, Florence Station, London, West Jefferson, Alton, over High Street, the center of Columbus to the landing at the Columbus Driving Park. The time to the Driving Park was 66 minutes. The machine crossed High Street at 11.40, the time to that point being 59 minutes for the 58.34 miles. The balance of the time was employed in manoeuvres at the Driving Park. The center of the track it almost exactly 2½ miles east of High Street, so the total distance flown was 60.84 miles, as measured by Mr. Williams Welch, of the office of the Chief Signal Officer in Washington.

This speed is the greatest yet made by any American aeroplane.

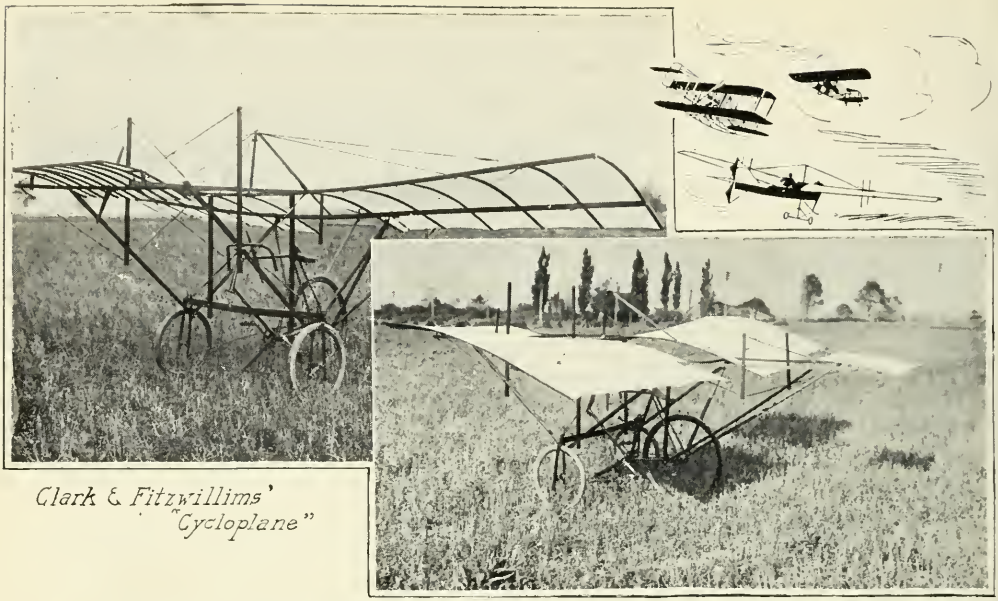
Corrected Distance Hoxsey Flight.

The distance from Springfield Fair Grounds to Clayton, Mo., Arch Hoxsey's first landing place on his record American cross-country flight, October 8, has been accurately measured by Mr. Williams Welch, chief draughtsman of the U. S. Signal Service, as 89⅝ miles. After stopping there to get his bearings he went on 7⅛ miles further to the aviation field at Kinloch Park, St. Louis, Ill., making a total distance of 97⅛ miles. Average, 32.5 miles per hour.

Rexford Smith Flies Near Washington.

Rexford Smith has made at College Park, Md., his first successful flights in his Curtiss type biplane, fitted with the 6-cylinder 100-125 h. p. Emerson engine. He only began experimenting with it on the 12th of November and it was flown by three different people, making 11 flights in all, of some 200 yds. in length. No attempt was made to make long flights. Mr. Smith is going carefully in order to avoid breaking up the machine. The machine is larger than standard Curtiss machines and has a system of control designed by Mr. Smith himself.

Orville Wright left November 15 for Germany to attend to matters connected with the affairs of the German Wright company.



Clark & Fitzwillims' "Cycloplane"

Flights in Unique Glider.

Messrs. Clark and Fitzwilliams, of 123 Southampton Street, Buffalo, N. Y., have devised a unique glider with which eight, so they state, successful glides have been made, the operator weighing 119 lbs.

This machine has approximately 100 sq. ft. of surface. Although it is 15 ft. by 16 ft., it weighs but a trifle over 55 lbs. The main wing is built so that it can be warped or put at any angle. Unlike any other glider, it has a bicycle arrangement by which it can be propelled at a sufficient speed to make flight possible. The elevating plane, which is 2 ft. by 3 ft., projects 4½ ft. from the main wing, while the rear plane, which is 2 ft. x 2 ft 8 in., extends back 7 ft. from the center of the main wing. To this plane is fastened the rudder, part of which is above the plane and part below. The machine is equipped with three wheels, two in front and the driving wheel half way back.

The machine is so arranged that, while in motion, it can be controlled by means of levers which are fastened to the framework directly in front of the person seated in the machine. Fittings, turnbuckles, etc., and Naiad cloth make the machine complete in every detail. Although unexperienced in gliding, flights beyond 100 ft. have been made successfully without a mishap. This machine was the result of three weeks' labor, and is to be used entirely for experiments.

A new design of an aeroplane is to be constructed in the near future. Small models of this design, driven by rubber bands, have flown at the height of 15 ft. for a distance of 62 ft. This new design of aeroplane will of course be 5 ft. by 5 ft. 8 in., and is to be driven by a contrivance which will be rigged up in lieu of a motor.

"Sky Pilot" Takes Sky Trip as Unwilling Passenger.

C. O. Hadley, of Steurer & Hadley, Tarrytown, N. Y., a one-time Y. M. C. A. aero course student, has been building an aeroplane at Empire City racetrack. During October, while testing his Emerson engine, with one man holding on each extremity of the plane, himself in the driving seat and the fourth man stretched out on the lower plane at work on the engine, the machine pulled the two first mentioned men off their feet and actually left the ground with the aforesaid dangling in the lower stratum of the upper air. As quick as Hadley discovered the predicament of his unintending birdmen he shut the engine off and the aeroplane decided to come back to Mother Earth, without damage to either Mother or the machine. Rev. H. E. Wright, a minister of the Gospel at Tarrytown, and U. G. Teetzell were the two men who hung to the wings.

Penn. State College Starts Big Work.

The Pennsylvania State College, of State College, Pa., is to be congratulated upon being the first college or university in this country to take up work in aeronautics on a large scale so far as known. The School of Engineering of this institution is now erecting a level circular track, two hundred feet in diameter, for making tests upon aeroplanes, propellers and planes. A car operated by an electric motor runs on the track at speeds up to 60 miles an hour. To this car are attached the planes or propellers to be tested. The frictional resistance, or lifting power of the planes and the propelling force and efficiency of propellers are determined through a series of dynamometers which record by electrical means on instruments placed upon a platform in the center of the circular track. The problem of plane shape and surface can be readily studied by this apparatus, as can those relating to the shape, size and speed of propellers.

M. F. H. Gouverneur, of Wilmington, N. C., has done work somewhat along this line, and with particularly fine facilities. He has made experiments upon surfaces mounted on a flat car, and run over a perfectly level stretch of track, propelled by an electric car. Mr. Gouverneur is interested in a trolley company in that city, and at night time there is no difficulty in making experiments to his heart's content.

Captain Willoughby's Control.

In the November number a note was made of Captain Hugh L. Willoughby's first flight, and in this note it was stated that "the front and rear horizontal rudders worked in conjunction with each other as in the Farman machine and some of the Wright machines." It is possible that this may have given the impression that Captain Willoughby made use of others' ideas. In a letter to "Aeronautics," he states:

"When Orville Wright made his first flight at Fort Myer, he gave me permission to use his warping wings, and in return I desired him to use my combination rudders (a patent having been applied for). Mr. Farman got them in a similar way. When he made his first flight at Brighton Beach I desired him to use my patents.

"By my permission Mr. Curtiss and Mr. Christie have put it on their monoplanes, and six other men have also adopted it on machines now building. I have publicly stated that I desired that it shall be used by everybody, and that I will not sue on infringements."

B. H. Dale, Little River, Kans., is another who is making a Demoiselle. A. Weiler, Jr., Syracuse, N. Y., is copying the style of monoplane put out by Max Stupar, of 9626 Erie Avenue, Chicago. Mr. Stupar is also building a "Stupar-Dumont" monoplane for J. Ponzio, Pullman, Ill., which will be ready for trials the first of December.

Ely Flies From War Ship.

Shortly after 3 o'clock P. M. on November 14, Eugene B. Ely, flying his Curtiss biplane, glided from the platform erected on the front of the U. S. cruiser Birmingham, stationed in Hampton Roads, Va., swooped down until he touched the water, then rose rapidly. Five minutes later he had landed safely on Willoughby Spit, near Norfolk, a distance of about three miles.

Impact Damages Plane.

The impact with which the machine struck the water after its thirty-seven foot drop from the front of the cruiser scarred one of the propeller blades, and a small piece was split from the blade.

He did not wait for the Birmingham to get into motion, which would have added to his momentum and thus have aided him greatly, but, seizing an opportune moment between the intermittent showers, he was off before those on the ship with him and on the other vessels stationed at various points nearby to follow and assist him in case of need, were aware that he was ready for his flight, the first of its kind in history.

Ely proved that it is possible to fly safely from a ship, and after having done this, asserted with emphasis that it would be an easy matter for an aeroplane to alight on a vessel, either while the latter was moving or standing still.

A platform twenty-five feet wide and eighty-five feet long had been built on the Birmingham, with a five degrees incline. The aeroplane was equipped with pontoons, which would keep it on the surface of the water for some time in case the machine should drop.

The flight was witnessed by many naval officers and others of high rank.

Arrangements were made on November 12 for a flight by "Bud" Mars (Curtiss) from a platform on the deck of the Hamburg-American liner Pennsylvania under the auspices of the New York "World," starting from a point fifty miles at sea, and newspaper men had sailed ahead, and had waited for several hours, the Pennsylvania came along, but without the aeroplane. In testing the engine the propeller was broken, and the aeroplane was taken off the ship before it started.

E. H. Wiseman, 1383 E. 92nd street, Cleveland, Ohio, is experimenting with the third aeroplane, a monoplane with a 3-wheel chassis, with a 4-cylinder, double opposed motor, 4x4, 25 h. p. This flew several hundred feet two days before Curtiss made his Euclid Beach to Cedar Point flight, and, so far as known, is the first Cleveland-built aeroplane to fly. The cylinders are steel, water cooled, and the engine weigs 88 pounds. It gives a thrust of 200 lbs. at 1,000 revolutions, with a 6 ft. by 7½ in. blade. The plane has 32 ft. spread, 25 ft. fore and aft. Single elevating plane and rudder, both in the rear. Supporting surfaces, 162 sq. ft. Shelby steel tubing is used, with basswood ribs ⅝ x ⅞ in., set 18 in. apart and covered with oiled muslin. Lateral balance is obtained by means of ailerons in the tip of each wing. The machine is controlled by straps on the shoulders for lateral balance and by a single lever, similar to the old-style steering lever of the Oldsmobile runabout, for up and down and sideways movement. The lateral beams in the wings are Shelby tubing. The single lever swings left and right for the rudder. The upper end, which breaks over, works the elevating plane. The ailerons are set inside the wing surface, hinged to the front beam and extend about two-thirds back.

According to R. O. Rubel, Jr., of Louisville, Ky., who has recently returned from a trip through the West, there is great activity all over the country.

The Montgomery monoplane, in Chicago, is all ready to make flights. This is built by James E. Plew, of Chicago, and Victor Lougheed. The Holmes rotary motor, which has not yet proven to be a success, is still being experimented with. A new model will be brought out which is said to resemble the Gnome. In Chicago no one seems to know that anyone in the same town is interested in aeronautics, at least there is no co-operation.

The Detroit Aeronautic Construction Co. has sold about 35 motors during the last year and are preparing to move into larger quarters. Handicapped up to this time by a none too large factory, their workmanship is good.

The Detroit Aeroplane Co. seems to be prosperous, having sold 48 of the 20-30 2-cylinder opposed motors. The concern is also making a monoplane, which is about complete, and is a cross between a Demoiselle and a Bleriot. A 6-cylinder, self-starting, 75 h. p. motor, designed on the lines of the 5-cylinder Anzani, will be out in a short while, under the management of Mr. Weinburg, designer.

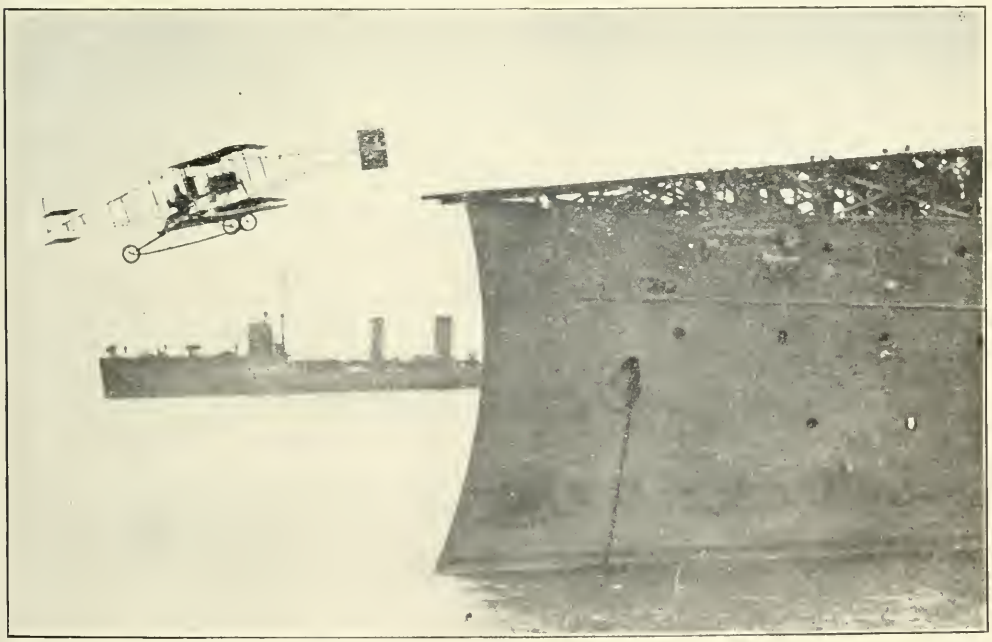


Photo Copyright by Underwood & Underwood

Eugene Ely in his Curtiss aeroplane starting on his flight from the deck of the U. S. Scout Cruiser Birmingham in Hampton Roads

20 Aeroplanes For Signal Corps.

Brig.-Gen. James Allen has recommended the acquisition of at least 20 aeroplanes in his annual report for the fiscal year ending June 30th last, which was recently made public by the War Department. Gen. Allen contends that his estimate is extremely low, and that it would provide for only two aeroplanes for each camp of instruction. To operate this number of machines, 20 trained officers would be required as pilots, and in addition, each machine must carry at least one observer, who would require much training and actual practice before the full military use of the aeroplane can be obtained.

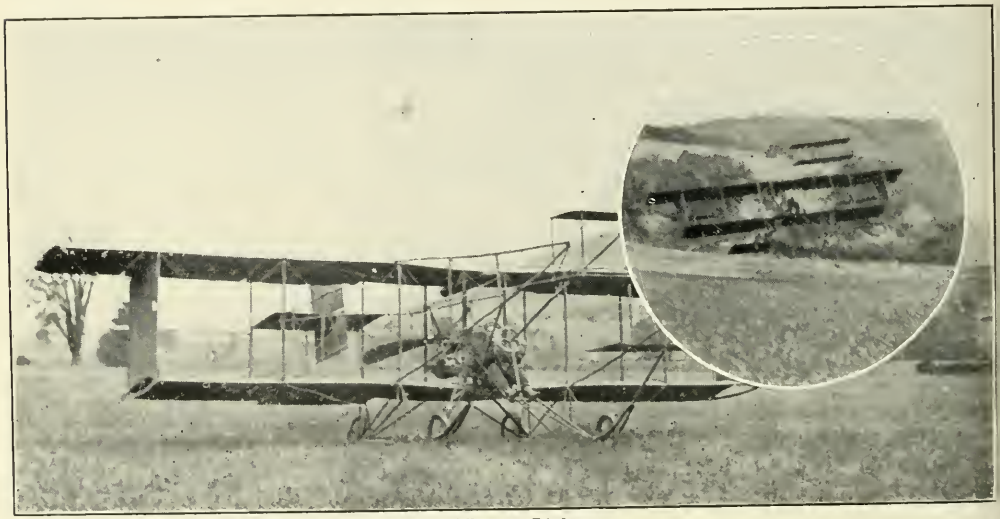
A monoplane has been built by Herbert C. Kellogg, of Kewanee, Ill., of 38 ft. spread and with a total of 285 sq. ft. sustaining surface. The plane is double surfaced, built of hickory and spruce and is 6 in. thick. The control is by a 3½ x 8 ft. elevator and two 2 x 4 ft. rudders at the rear. The center of weight is 5 ft. below the plane, and is mounted upon three wheels, two being driven by spur friction from the engine. The propeller is of his own design, 8 ft. in diam., built completely of steel. It is chain-driven by a 4-cylinder Boulevard engine, fitted with a clutch on the engine shaft sprocket. The aim is to build a machine which will be absolutely reliable as to construction. For that reason he is using steel in the construction throughout, with the exception of wing construction.

Commencing with the elementary principles of aeronautics the classes will advance with studies of both aeroplanes and dirigibles to the most intricate problems of air flight down to the inevitable "slip" and the proper "pitch" of the propeller. In the laboratory work in gas engines the students will use the laboratories and equipment of the automobile and motor boat schools. As a successful flight inevitably depends on an efficient gas engine this part of the course will not be neglected.

Wilbur R. Kimball is conducting the course. Besides the classroom studies, it is planned to have the members of the course visit the testing grounds and aerodromes in the vicinity of New York, inspect actual flying machines of different types and observe professional aeronauts in actual flights. Members of this class will also make model aeroplanes which will be tried out and their defects and virtues pointed out.

That the course in aeronautics is practical and helpful is proven by the achievement of Clinton O. Hadley of Tarrytown, N. Y., a graduate of last year's class, who built a biplane which at its tryout on October 12, circled the Empire City track carrying four persons—Mr. Hadley, Rev. H. E. Wright, U. Grant Teetsell and Julius Graveson, all of Tarrytown. Mr. Hadley has his biplane entered in the Aviation meet at Belmont Park. He says that his machine is a result of his course at the West Side Y. M. C. A.

On October 31, the opening night, the class heard talks by Clifford B. Harmon and Winthrop E. Scarritt.



The Thomas Biplane

The Kirkham-Eells Co., located at Bath, N. Y., are making complete aeroplanes for the market. We have had reports on many good flights, but have been unable to obtain any data as yet from the company, as it has been so busy. This information is promised us for the January number. They are makers of propellers and the well-known Kirkham motor.

The Young Men's Hebrew Association in New York offer a course in kites and model aeroplane construction to elementary and high school pupils. The course includes a study of the principles of aeronautics, besides its history. Twenty-five boys are now constructing models. One model dirigible is under construction. Mr. A. E. Horn is giving the course.

Aviators of the future will be trained in a special course in aeronautics at the West Side Young Men's Christian Association, 318 West 57th street, and the indications are, from the present enrollment, that the class will be a popular one. The object of the course is to give a working knowledge of the principles that must be followed in the construction and operation of both aeroplanes and dirigibles.

William T. Thomas, of 394 Canisteo Street, Hornell, N. Y., reports very good success with his biplane, of which readers have heard before. His plans are to enter the exhibition business.

He says: "One of our hardest problems was getting the machine to fly easily, due to its weight, as the motor weighs 225 lbs. for 30 h. p., and as the rest of the machine was built rather on the heavy side, we have a total of some 850 lbs., including weight of aviator. However, the Kirkham 4-cylinder motor has worked to perfection, and as this is practically a standard automobile engine it stands up well, and is good for a tremendous amount of service. The running gear has also acted perfectly, and the fact that during more than a hundred jumps while learning, we still use the same wheels and tires we started with."

H. McGregor, 1611 19th Street, Bakersfield, Cal. is building a Santos-Dumont type machine, and intends to begin flights latter part of December.

AT THE MINEOLA FIELD

By J. Suche.

The Addosides Machine

SEVERAL new machines have made their first flights from the Aeronautical Society's grounds at Mineola during the past month, ending the middle of November.

Up for 49 Minutes in Moonlight.

Perhaps the most interesting was a night flight by Tod Shriver, who stayed up for 49 minutes, coming down at 9:39 P. M. This was his very longest flight, and he was not an expert yet. Since then he has filled several exhibition engagements, and will shortly go to the coast.

First Aeroplane Built by Woman.

Early this spring Miss E. L. Todd, who has been experimenting for a number of years with models, and organized the Junior Aero Club, had a biplane built by Wittemann Brothers. Work on this, trials and alterations have continued all summer, until a few days ago it was given its first flight, with D. Masson, Paulhan's mechanic, as aviator. Both times it was taken out it flew very well. It was found the controls were not balanced, and caused too much exertion in their operation.

The striking features of the Todd machine are: wings curved from the center outward like a bird's wings; in soaring, planes quite far apart, which necessitates heavier struts and increase in weight, mounted on tall skids, with the result of making the apparatus set well above the ground. The spread is easily over 40 ft., with surfaces 6 ft. 6 in. fore and aft. The front control is a single surface similar to Captain Baldwin's. In the rear there is a rigid stabilizing plane, and behind that, hinged to its rear edge, is a hinged control working in connection with the front control. Underneath the fixed rear plane is a vertical plane. The skids are of Farman type, with two 28 in. wheels mounted on an axle. Curtiss-type ailerons are placed between the main planes, hinged to the front strut. The engine is an eight cylinder 60 h. p. Rinek, driving a propeller 7 ft. 6 in. x 4 ft. The engine is mounted on the lower plane. Shoulder braces operate the ailerons and the balance of the control is practically Curtiss style.

Charles Henry (Dr.) Cooke has sold his Elbridge engined Curtiss type biplane to a southern man.

The machine of Samuel Barton, Curtiss-type, has been overhauled, the outriggers lengthened front and rear, and an Elbridge 4-cylinder engine installed. After these alterations it has been able to get off the grounds, but it is not yet in perfect condition.

The Walden-Dyott Co., which has only had its building a month, is now building its third monoplane. Anzani engines are being fitted.

Louis Rosenbaum has removed his big monoplane into the big shed, and is ready for a try-out in another week. M. P. Talmage is rushing work on his new Curtiss-type machine, and expects to have it ready for the holidays.

N. C. Addosides, of Wilmington, Del., has purchased the Curtiss-type of William Patterson. After trying two other motors he installed a 3-cylinder Smalley, of 30-40 h. p., and made some eight flights—that is, Aviator Masson did the flying. The Smalley motor is all aluminum, two-cycle in principle, cylinder 4½ square. The cylinders have cast iron liners.

Masson and Marcel Penot both have been flying the machine of the Mohawk Aviation Co., an exhibition concern, since the 30 h. p. Harriman motor was changed for a 50 h. p. This machine is another Curtiss-copy, with the upper plane extending out beyond the lower.

Two Machines Smashed.

On November 10 two machines were smashed in being tried out. Charles B. Morok tried out a Shneider-made Curtiss-copy, but could not find the switch to shut off his 4-cylinder Elbridge motor. In place of the two rear wheels as usual in Curtiss-type machines, he has skids with two 20 in. Hartford wheels for each, Farman style. There is another wheel out front. Nicholas Rippenbein has a light Shneider-made biplane, along Farman lines in appearance. This was demolished in landing after a short flight. His equipment includes another Elbridge, with Hartford tires on 20 in. wheels.

Joseph Seymour has returned from an exhibition tour through New York State.

The recent heavy gales that have been raging for the past two or three weeks have depopulated the tents very rapidly. During the process there were a number of machines that were badly damaged. One of the most notable accidents was the lifting of Mr. Davis' tent, machine and all over the fence into the flying grounds. When rescued the machine was a sorry-looking object, as it had been bent and twisted out of all recognition as a flying machine. The funny part of this accident was the fact that the machine was staked down to the ground, but was of little benefit, as the wind took it, stakes and all.

No one seems to have considered gas and oil consumption on aeroplanes. The big Wright machines use 22 lbs. of gasoline per hour, and 1 lb. of oil. The 4 cylinder small machines run 23 lbs. of gas to the hour.

NEWS ON THE PACIFIC COAST.

By C[illegible]e [illegible]

[illegible]-Peters No. 2

THE W[illegible] [illegible] [illegible] [illegible] ciricl [illegible] [illegible] [illegible] machine, [illegible] said [illegible] fl[illegible]r; this is [illegible] in turning, th[illegible] [illegible] skidding found [illegible]. This quality is [illegible] placing of th[illegible] [illegible] give, undoubt[illegible] a grip [illegible] of laminated ribs [illegible] and the lowering [illegible] th[illegible] such objects strung [illegible] noticeable chang[illegible]s [illegible].

Planes spread [illegible] and the [illegible] chine fore and a[illegible] is [illegible] ft. [illegible] leading edge. Rear beam is [illegible] 6 ft. 2 in. Camber [illegible] in., about [illegible] Fabric Naiad No. [illegible], laced [illegible] edge is laced to [illegible] running through [illegible] rib ends. Ribs of 7 laminations, [illegible] section. Intermediate ribs 3 [illegible] in. Their peculiarity is a slight [illegible] rear ends. The superior [illegible] is doubtful as, if th[illegible] [illegible] this upward curve [illegible] Experiment Association's [illegible] discarded.

Supplementary Planes. [illegible] rudder as shown in [illegible] changed to a single surface [illegible] works in conjunction with a [illegible] on the edge of a [illegible] The outriggers ha[illegible] [illegible].

Control. Same as in old machine. The Farman type ailerons on No. 1 have [illegible] disc[illegible] for Sommer type hinged on upper surface.

Running Gear. Considerably lower. No [illegible] are used, cold rolled steel [illegible] 32 in. [illegible] to the proper angles. Skids are of [illegible].

Power Plant. Unchanged. Weight [illegible] operator 750 lbs.

Aeronautics at Paci[illegible] World F[illegible]

The management of th[illegible] [illegible] tion, to be held at San Fra[illegible] probabl[illegible] make [illegible] for a demonstration of [illegible] aviation and a[illegible] [illegible]ies. The [illegible] Louis in 1904 was the first to [illegible] nition to air navigation, and [illegible] fair directors regarded the [illegible] [illegible] and th[illegible] [illegible]mplished by R[illegible] [illegible]sely.

[illegible] made practica[illegible] [illegible]sition will be th[illegible] [illegible] for a summing [illegible] [illegible] a showing of the p[illegible] [illegible] devoted to aeri[illegible] [illegible] importance.

[illegible] [illegible]ians interested [illegible] [illegible] are the unusu[illegible] [illegible] demonstrating every phase [illegible] [illegible] 1915 [illegible]. San Francisco h[illegible] [illegible]s long, over which [illegible] maneuver at will, lo[illegible] [illegible] and the mountains clo[illegible] [illegible] demonstration th[illegible] [illegible] air machines. For th[illegible] [illegible] that practical experimen[illegible] [illegible] value to the gover[illegible] [illegible] army and navy expen[illegible] [illegible] may be worked out on [illegible] [illegible] ration of the fa[illegible] [illegible].

[illegible] clubs are working for t[illegible] [illegible] Exposition and i[illegible] [illegible] Congress, and Los Angel[illegible] [illegible] San Francisco in this. T[illegible] [illegible]ia has appointed an expo[illegible] [illegible] consisting of George B. Harris[illegible] [illegible] and Bud [illegible] Green, to stimula[illegible] [illegible] the importance of the [illegible] [illegible] clubs throughout t[illegible] [illegible].

[illegible] of Oakland, is one of the latest [illegible] [illegible] the ground in a [illegible] [illegible]. After several uns[illegible] [illegible] among other things, t[illegible] [illegible] to have too much in[illegible] [illegible] a short flight, but w[illegible] [illegible] when struck by a s[illegible] [illegible] slightly damaged the m[illegible] [illegible] follow[illegible].

[illegible] camber, 1 in. R[illegible] [illegible] for which gr[illegible] [illegible] claimed it is said m[illegible] [illegible] be lifted by the t[illegible] [illegible] [illegible]rtiss type) double. Pow[illegible] [illegible] 35-h. p. auto engi[illegible] [illegible] lightened. Drives dir[illegible] [illegible] pitch propeller. Co[illegible] [illegible] issue.

THE VOYAGE OF THE AMERICA*

By Melvin Vaniman.

For 75 days ... late ... look in the morning until 7 ... and often much ... thoughts as ... journey.

We realized well that ... the whole thing was ... tion. We knew the ... Atlantic to the spot ... miles. We knew the ... even midnight and ... carry enough gasoline ... miles, and we knew ... the wind helping us ... had to enlarge the ... order to make our ... Atlantic.

With all preparations ... tions carefully ... applies on board ... on, we started on ...

On the morning ... ship. Conditions ... look our way out to ... did not want to ... ocean steamships. ... rator trailing along, a ... sult in serious difficulty. ...

All day Saturday there ... note. For four hours ... ceipt of wireless messages ... ect, we picked up messages ... rent points.

We could hear the Atlantic ... other operators that the ... ntic City, and occasionally ... ork asking for news about us. ... ar boats sending messages ... her.

Everything went well until ... ... ad the motor running its full ... nd was blowing us toward ... is a very ... ce than the length of the ... ... ember that the equilibrator was ... rough the waves below us. You can ... agine that we were somewhat ... of the boys called out that ... front of us. You may also be ... at it would mean to us if the ... with the equilibrator. The ... ubt footing its foghorn, but ... t hear it—in fact, we could not ... cept the whirr of the motor ... rn on the helm we succeed ... e ship. I forgot to mention ... ssipated some gas, and we could ... below us; and we were ... range appearance to the passengers.

After this incident there was no ... e night, except that the motor ... t it seemed that the better it got ... n.

All day Sunday, from about ... s operator tried to get in ... e shore. He could hear ships ... tried to get in with them ... ations were not able to hear him.

Sunday night our troubles began ... s that the equilibrator did not ... ne people have described. The ... g at the rate of 30 to 35 miles ... ves ran high, and the equilibrator ... ch in the water and the air ... d a tendency ... We had to keep ... available, ... ted 15 of the 29 gasoline tanks ... ilibrator ... t last lone, ... wn, until finally ... t, and ... ove the water. ... ing 20 or 30 ... ain immediate ... s was to keep ... mediate danger ... wertheless I can ... lcome. We had ... soline that we ...

... Trent and ... Things were beginning to ... as we knew we were 200 or 300 ... s, and it meant two or ... if we should cut it off ... could reach land or ...

... Trent that the nearest ... We decided to ... got into the boat, ... which held it to the rest ... where the danger lay, ... undertaking, for we ... with the spray. We set off, ... speed, but she was ... as if she could not ... and that our little boat would be cut ... that the Trent coming ... in. She passed us, ... so that the propellers ... After steaming ahead ... came back, and we ... aboard.

... questions asked by ... that the equilibrator was ... as a ... the experience ... an airship to cross ... Wanman attempt would ... ordinary conditions.

... up of 29 tanks, con- ... containing 15 gallons ... had a method of ... the ship when gasoline ... was then emptied ... from the sea by ... pocket.

... of 20 per cent. ... from the top of ... though during ... weather, it was often ... end of it ...

... the "bags" of the ... drawings, but that if ... would un- ... stated that ... was too long, as ... ever out ...

... about 20 days before ... and the loss of gas ... caused by percolation ... the hull.

... cost originally about ... increased 21 per cent. for ... equilibrator weighed ... Admiral ... when ... was probably ...

... had become ... accustomed. Mr. Vani- ... drifted away, ... it was practically ... opinion that ... this way.

... to a question, ... light of the ... more than 100 ft. ... Trent. It said that ... messages for 200 ... had no difficulty ... them and their ... as their appa- ... miles. The wireless ... was not volt- ... farther than 50 miles. ... fastened to the equili- ... and to the car itself ... that it only ran ...

... stated that h ... was entirely ... gained he ... trying it again ... would have to ... made in the ... a result.

... before the Aeronau-

BELMONT INTERNATIONAL AVIATION MEET

New World Records at Belmont

Altitude, Johnstone,		- - -	9714 ft.
5 Kil., Leblanc,		2m. 44.78s.	12th lap
10 "	"	5m. 30.92s.	1st and 2nd lap
20 "	"	11m. 04.78s.	11th to 14th lap
30 "	"	16m. 38.31s.	1st to 6th lap
40 "	"	22m. 12.58s.	1st to 8th lap
50 "	"	27m. 48.70s.	10th to 19th lap
60 "	"	33m. 22.80s.	1st to 12th lap
70 "	"	38m. 55.80s.	1st to 14th lap
80 "	"	44m. 29.50s.	1st to 16th lap
90 "	"	50m. 04.57s.	2nd to 19th lap
100 "	White	1h. 1m. 04.74s.	
¼ hr., Leblanc,		27.04 Kil. (figured)	
½ hr., Leblanc,		53.92 Kil. (figured)	
1 hr., White,		98.23 Kil. (figured)	

Two-man speed for 5 Kil., De Lesseps, 5m. 12.15s.

THE second meeting of its kind in this country, and, of course, by far the greater, was the international tournament conducted at Belmont Park race track, on Long Island, October 22-31, by the Aero Corporation, Ltd., and the Aero Club of America as respects the Gordon Bennett race.

There was great flying, despite the windy weather to be expected at this time of the year—rain the very first day, and no flights at all on the second on account of the wind. It can rank favorably with many of the meets that have been held abroad the past year. At not every foreign meeting have so many new records been made. Perhaps the biggest feature of the meet, and the one that really was the reason for a meet, was the Gordon Bennett race. Only a most unfortunate accident deprived a son of France of the victory; but she can console herself with the honor of the winning of the contest with a French-built aeroplane.

The one other great event of the meet was the placing of the American flag at an altitude higher than an aeroplane has ever taken a nation's banner. It is with the utmost sorrow that we are reminded poor Johnstone can never more defend his title to renown. Hundreds of thousands whose hearts have stood still in delicious awe of his wonderful feats now mourn his loss. Absolutely fearless, a master of his machine, had his life been spared he would have traced his name in fantastic flights in the heavens of the entire world.

Lack of experience and too little time after operations were actually started seem to be the reason for so much friction between aviators at the Belmont meet and the organization conducting the affair.

The aviation committee, consisting of J. C. McCoy, J. A. Blair, Jr., Lyttleton Fox, Major Samuel Reber, U. S. A., and Charles M. Manly, worked most harmoniously together, and to them great credit is due.

The Gordon Bennett.

It was originally planned to have an elimination race to select the American team. On the day set for this, those who were available thought it too windy and did not enter. Matters hung fire until the last moment, when the American team must be named under the rules of that race, and the Aero Club of America named Walter Brookins (Wright 61), J. A. Drexel (Bleriot 50), and Chas. K. Hamilton (110 Curtiss type), with J. A. D. McCurdy (Curtiss 51), J. B. Moisant (Bleriot 50), and Arch Hoxsey (Wright 30) as substitutes. When Brookins had his accident Moisant started in his place.

The French team was Alfred Leblanc (Bleriot 100), Hubert Latham (Antoinette 100) and Emile Aubrun (Bleriot 50), in place of Labouchere, who was previously named.

England had Claude Grahame-White (Bleriot 100), James Radley (Bleriot 50) and Alec. Ogilvie ("Baby Wright" 30).

The distance was 100 kil. (62.13 m.), over a 5-kilometer course. The contestants could start any time between the hours of 8:32 A. M. and 3:32 P. M.

Gordon Bennett Results.

(1) White (100 Bleriot), 100 kil., 1:01:04.74.
(2) Moisant (50 Bleriot), 100 kil., 1:57:44.85.
(3) Ogilvie (30 Wright), 100 kil., 2:06:36.69.
(4) Latham (100 Antoinette), 100 kil., 5:47:53.41.
(5) Leblanc (100 Bleriot), 95 kil., 52:49.70.
(6) Drexel (50 Bleriot), 35 kil., 26:04.08.
(7) Radley (50 Bleriot) made only a lap. Was flagged down as he started after the time limit.
(8) Hamilton (110 Curtiss-type) did not complete first lap. Started after the time limit.
(9) Aubrun (50 Bleriot) did not start.

Timed by the Warner electric timer and the New York Timers' Club.

White Breaks Record.

In the calmest part of the day White started, never having flown the 100 h. p. machine before, at 8:42:39.66 A. M., and finished the course at 9:43:44.40. His best time for a lap, the fourteenth, was 2 m. 55.77 s., a speed of 102.4 k. p. h. (63.59 m. p. h.). White's time for the 100 kil. was 1 h. 1 m. 4.74 s., a mean speed of 98.23 k. p. h. (61 m. p. h.), a new world record for this distance and for one hour. (Leon Morane established a new world record for 100 kil. of 1 h. 6 m. 39 s. at Bordeaux meet in September and made a new record of 90 kil. for one hour at the same meet.)

While he was up Leblanc crossed the line, at 9:00:20. Though with the same horse power, Leblanc's slowest lap was more than 5 seconds faster than White's best. Leblanc's eleventh lap was made in 2 m. 44.78 s., a speed of 109.2⅞ k. p. h. [67.8⅝ m. p. h. Curtiss won last year's Gordon Bennett with a speed of 47.06 m. p. h.] He did not equal Radley's world record speed for 1 mile, made in England, of 75.95 m. p. h., or a mile in 47 2-5 secs. At St. Louis October 14, Leblanc made a speed of 67.9 m. p. h., or 1 mile in 53 sec.

Leblanc Has Wonderful Escape.

Just after finishing the nineteenth lap (95 kil.), at 9:53:09.7 A. M., the unfortunate Leblanc hit a telegraph pole head on, breaking the pole square in two. One cylinder was bent in and minor damage done the engine. The framework and one wing were badly damaged. Leblanc escaped with but a cut. He had been saving his machine for this one event and had the cup almost within his grasp. In winning his elimination race in France for the selection of the French team, Leblanc covered the 100 kil. in 1:19:13 3-5, much slower time than he was making at Belmont.

New World Records by Leblanc.

New world records were made by Leblanc for distances, according to the schedule laid down by the international federation, from 5 and 10 kil., continuing by tens up to and including 90 kil.

The next to start was Alec. Ogilvie, of the British team, with his "baby" Wright 30, at 9:08:53.23. His first was his fastest lap, at a speed of 89.27 k. p. h. (55 m. p. h.). At 9:53:02.20 he had to land on the far side of the course with a bad spark-plug, where he stayed for nearly an hour. Up again, he pluckily kept on, for the full 20 rounds, finishing at 11:15:29.92 A. M.

Latham, of the French team, was the only other to start in the morning, and he went up at 10:58:55.67, before Ogilvie came down. He, too, had trouble and landed at 11:50:52.35 A. M., after making 15 laps, and it was 4:32:19.93 P. M. before he got going again. He finished his full 20 laps at 4:16:49.08.

The wind seemed to increase during the afternoon, and as the time limit (not later than 1½ hrs. before sunset) drew near Drexel started in his Bleriot 50, at 3:25:56.53 P. M., Moisant (alternate for Brookins) following at 3:31:35.35, a fraction of a second before the limit.

Drexel (Bleriot 50) finished seven laps at 3:52:00.61 and landed, not to go up again. His very best lap was nearly 7 sec. slower than Ogilvie's (Wright) best.

Moisant was down for over 40 min. on his seventh lap, and finally completed the full course by 5:29:20.20.

Radley (British, with a Bleriot 50), and Chas. K. Hamilton both started after the time limit. Radley was flagged and made only one lap. Ham-

ilton, with his rated 110 h. p. Curtiss-copy, didn't even get around once. Something went wrong with his power plant.

Walter Brookins, the chief hope of the American team, fell to the ground in front of the grandstand before he had given official notification of his intention to start. Four cylinders of his 8-cylinder engine stopped, and he tried to land on the field. He apparently touched all right, but he was spilled out and the machine turned a somersault and landed upside down. His speed was estimated at 80 miles an hour just before he stopped. His racing 61 h. p. Wright was smashed beyond early recall and Brookins was hurried to the hospital. He was not seriously injured.

Aubrun, the third French representative, did not start in the Gordon Bennett at all. It was ruled that those starting in this race would not get the expense money allowed in gathering the aviators for the meet. Aubrun decided that gold was preferable to glory.

Ogilvie Had Speed Over Bleriots.

Had Latham, Ogilvie and Moisant not had to land during the Gordon Bennett race, and Drexel had not quit, their standing would have been different. Latham would have been third, followed by Ogilvie, Drexel and Moisant.

Only the 100 h. p. Gnome Bleriots of White and Leblanc, and the 100 h. p. Antoinette, had more speed than the 30 h. p. Wright of Ogilvie. An addition of his time by laps shows much faster time than the 50 h. p. Gnome-engined Bleriots. All the Bleriots and the two Farmans had Gnome engines, and all Bosch magnetos.

Hamilton was unofficially timed for 1 lap (2.5 kil.) in 1:24, a speed of 107.14 k. p. h. (66.53 m. p. h.) which is faster than White's average. The Wright 8-cylinder was timed unofficially in 1:23, which means 108.43 k. p. h. (67.33 m. p. h), and it is not supposed the machine was going its best.

The longest continuous flight of the meet was made by White, 22 laps of the 5 kil. course, or 110 kil. (68.3 m.).

Johnstone Breaks Altitude Record.

The very last flight on October 31, the added day of the meet, was the great achievement of the late Ralph Johnstone in one of the "baby" Wright machines, designed especially for altitude work. He had never flown one of the small machines, and this one was 12 ft. smaller in spread than the standard type. Orville Wright had already tested the machine out and he knew how fast it would climb.

Before long Johnstone was completely out of sight in a clear sky, so high was he. Drexel was his competitor. While they were up other events were run off. The Demoiselles flew their only race of the meet; McCurdy and White had it out for 10 laps, and the Aero Club of America Distance Race was flown.

It was dark before Johnstone and Drexel could be distinguished moving rapidly downward. The stars were all out and were used to locate for others the positions of the high flyers.

It was a moment never to be forgotten. All were wondering if the 10,000 feet which would bring an added prize, had been reached. It was so dark on the ground that a man could not be distinguished a few feet away. In front of the grandstand red fire was burned to aid the two fliers. As the specks up in the blue grew to dots, and then rapidly took shape as the downward rush brought them nearer the earth, Drexel's motor could be heard running. Johnstone's had stopped and he was gliding rapidly. As he landed, we rushed over to read the barograph.

We knew he had broken the world record of 9,186 ft., but just what his actual height was we could not determine in the dark. Then we got the Drexel barograph and we learned that Johnstone had the record for himself.

Statue of Liberty Race.

Moisant won the $10,000 prize for a race around Miss Liberty, on Sunday, October 30, with White (100 h. p. Bleriot) and De Lesseps (50 Bleriot) as competitors. Both White and De Lesseps had made the trip before Moisant started with a machine in which he had never before flown, a 50 Bleriot belonging to Leblanc and which Moisant had just purchased.

De Lesseps started first, and a moment later White crossed the line. Both machines quickly disappeared in the face of the setting sun. After half an hour a speck could be distinguished against big blazing Sol, followed by a second, which was De Lesseps. White had overtaken him.

Soon Moisant got away. Disregarding the less-direct route taken by White and De Lesseps, he flew in a straight line for the statue in New York's harbor, 16.4 miles away, over the town of Jamaica, and over the buildings of Brooklyn, around Stevens' balloon attached to the upper part of the figure of Miss Liberty and back in almost a minute less than White consumed in avoiding densely built Brooklyn.

White immediately protested, saying that he wanted to try again for the prize, the following day. On another trial, taking the same course that Moisant took, with twice the power, White would very likely win and, of course, he would not kick. The race was set down for this day on the day's programme, everyone was free to go after the prize and over any course. Moisant saw fit to take all risks, and seems to be entitled to the award.

Many Features Not on Programme.

Not all the flying was by schedule. The wind was at nearly all times too much for the genial Captain Baldwin, and all his flights were unofficial. Willard, Mars, Ely, and McCurdy made many fine, and some sensational, flights in the late afternoons, silhouetted against the gold and red of the western sunset. Hamilton, too, with his black piratical-looking craft, smoke streaming behind from a flooded engine, seemed to have abnormal speed in the dark of the evening. De Lesseps and the other foreign aviators made many flights purely for the flight itself, sometimes taking along a lady passenger.

Altitude Flights Awe-Inspiring.

The fast-falling nights of late October frequently threw an almost impenetrable shroud about the pin-point of an aeroplane thousands of feet from the earth. Day after day Hoxsey and Johnstone alternated in beating each other out of sight. Four thousand, five, six, seven, and eight thousand feet were made time after time. The only ones up, almost total darkness about the field, discoverable up against the night blue only by those with strong glasses and pointed out by them to less fortunate watchers with the stars for guide-points, these two wing-ed but wingless "birdmen" climbed until the field was blotted out to their sight, save for the blazing gasoline beacons started by the shivering parent birds Wright in front of their nests.

Four new American height records were made at the meet, one of them a world record, as follows:—

Drexel,	7105 feet,	October 24
Johnstone,	7303 feet,	October 25
Johnstone,	8471 feet,	October 27
Johnstone,	9714 feet,	October 31

Johnstone and Hoxsey Fly Backward.

Johnstone and Hoxsey flew to approximately eight and seven thousand feet respectively, on October 27, in a wind which drove them actually backward. Near the ground the wind was blowing at a rate which none but the Wright machines and Latham's Antoinette dared combat. Latham could be seen working with might and main to keep his equilibrium. Johnstone and Hoxsey started for altitude. The higher they flew the less they were able to advance, until at last they could be seen, one keeping just exactly the same distance behind the other, headed into the wind, but going steadily backward away from the field until out of sight. Just imagine taking one step forward and slipping back two. That's what they did.

Hoxsey was driven back to Brentwood, L. I., 25 miles to the east. Johnstone got down at Middle Island, about 42 miles from the grounds. The velocity of the wind at their altitude was figured at between 70 and 80 miles an hour. The next day both men flew back to the grounds.

The Wright machines were nearly always first up every day. Wind had no terrors for them. When there was no prospect of flights by other machines until later in the afternoon the Wright flyers got up and stayed up, though the spectators often came near having heart failure when it appeared as though an extraordinarily tough gust would capsize them.

It is impossible to obtain actual figures on the wind on the day Hoxsey and Johnstone were driven backward. On the ground the Weather Bureau anemometer registered but 16 m. p. h., though there were gusts of twice that velocity. Records made at the Eiffel Tower show four times the velocity in 1,000 ft. of altitude. In Germany and at Blue Hill the records show twice the velocity in this distance upward. At 4:30 on this day the wind blew 30 m. p. h. on the ground.

The management of the meet should congratulate themselves on being favored with such good weather as they did have, for the latter half of October is usually inclined to be much more windy. August and September should be the months for an aviation meet in this section.

Cross Country Flights.

The cross country flights were not very spectacular. The entrant crossed the line and quickly disappeared from sight and for the most part forgotten in watching the flying near at hand. After rounding the balloon at Hicksville, where Leo Stevens had his hydrogen plant and wireless outfit, communicating with the judges' stand, ten miles away, the aeroplane would return and circle the course and land, scarcely noticed by the crowd. On one day the balloon could not be located at all on account of the fog.

In the cross country flight of October 25 McCurdy had to land in a field near Rockville Center. The next day he flew it back to the field.

On one occasion the cross country men lost the balloon in the fog and failed, of course, to round it.

Baldwin and Frisbie Fly from Mineola.

The day before the meet opened J. J. Frisbie flew over from Mineola, a distance of 5 miles, just after sunset. After some argument he was finally allowed to enter the meet. The flight took him directly over the buildings of the fair grounds at Mineola, and the scattering houses and trees on the way. Captain Baldwin flew over the next day with a brand-new machine painted red, with his red rubber cloth surfaces.

The Demoiselles.

The Demoiselles were really the hit of the meet. On only two occasions did they make more than one complete round of the course, on account of motor trouble, but they caused a wave of amusement each time they bumped and bounced across the field for a start. They certainly had great speed when they did fly. They resembled some monster bug without the buzz. One even turned upside down without doing the aviator any damage.

Spectators Got Mixed Up.

It was impossible to keep track after the first lap or two of the standing of any of the aviators in the hourly duration and distance contests, except by following the bulletin board, and then it took several pages of the programme to figure out the hieroglyphics thereon, and in the meantime the machines had made some more laps and it was all off. On the second flying day there were eleven machines in the air at once, sometimes as many as four and five bunched in one place, with a rear-end collision almost inevitable. When only two or three were up at a time people got tired and hied themselves to the ever-crowded bar. Another meet should provide for events of more interest. If, say, three machines were started from a line at a given signal for one or two lap races, the crowd would be on its feet with enthusiasm. For another, start several from a line for a cross country, the first man back to win. The people could then actually tell without a lexicon who won.

A Few Smashes Occurred.

Tod Shriver, limping around the field on crutches, the result of a previous exhibition flight, flew unofficially the opening day and ended by smashing his machine. This put him completely out for the entire week. The day of the Statue of Liberty race Moisant smashed his propeller and damaged his wing by hitting Harmon's Farman just as he was running along the ground for a start. The big Farman had one whole side wrecked. Moisant smashed his machine three days before the meet opened, taking his feet off the rudder control to kick open the gascock.

The second day of the meet, October 23, no one flew. The wind was fearful. White did attempt a flight and got off the ground but had to land shortly. The wind tipped the machine over on its side and there was another job for the repairman. Moisant brought out his Bleriot and before he could get in it it was on its back and broken.

Brookins smashed his 8-cylinder Wright on a preliminary trial.

On the last day of the meet White turned his 100 h. p. Bleriot over in front of the grandstand just as he landed.

Repairs to the smashed aeroplanes were quickly made by the new Lovelace-Thompson Co., at Fort George, New York City.

Clifford B. Harmon did not fly at all officially and his only flights were for his own amusement.

H. S. Harkness did not fly his Antoinette at all during the meet.

ENTRANTS AT BELMONT.

Monoplanes.

C. GRAHAME-WHITE (England)—
Bleriot, 50 Gnome.
Bleriot, 100 Gnome.

JAMES RADLEY (England)—
Bleriot, 50 Gnome.

COUNT DE LESSEPS (France)—
Bleriot, 50 Gnome.

J. B. MOISANT (America)—
Bleriot, 50 Gnome.

J. A. DREXEL (America)—
Bleriot, 50 Gnome.

RENE SIMON (France)—
Bleriot, 50 Gnome.

EMILE AUBRUN (France)—
Bleriot, 50 Gnome.

W. E. McARDLE (England)—
Bleriot, 50 Gnome.

C. AUDEMARS (Switzerland)—
Demoiselle, 30 Clement.

ROLAND GARROS (France)—
Demoiselle, 30 Clement.

ALFRED LEBLANC (France)—
Bleriot, 50 Gnome.
Bleriot, 100 Gnome.

HUBERT LATHAM (France)—
Antoinette, 50 Antoinette.
Antoinette, 100 Antoinette.

EUGENE ELY (America)—
Curtiss, 65 Curtiss.

RENE BARRIER (France)—
Bleriot, 50 Gnome.

HARRY S. HARKNESS (America)—
Antoinette, 50 Antoinette.
Antoinette, 100 Emerson.

Biplanes.

C. GRAHAME-WHITE (England)—
Farman, 50 Gnome.

*CAPT. T. S. BALDWIN—
Baldwin, 50 Curtiss.

*CHAS. K. HAMILTON—
Curtiss-type, 61 Christie.
Curtiss-type, 51 Hall-Scott.

*CLIFFORD B. HARMON—
Farman, 50 Gnome.

*J. A. D. McCURDY—
Curtiss, 50 Curtiss.

*J. C. MARS—
Curtiss, 50 Curtiss.

*EUGENE ELY—
Curtiss, 50 Curtiss.

*WALTER BROOKINS—
Wright machines. See American schedule.

*ARCH HOXSEY—
Wright machines. See American schedule.

*RALPH JOHNSTONE—
Wright machines. See American schedule.

*P. O. PARMALEE—
Wright machines. See American schedule.

*ALEC. OGILVIE—
Wright machines. See American schedule.

‡*J. C. TURPIN—
Wright machines. See American schedule.

*TOD SHRIVER—
Curtiss-type, 30 Kirkham.

*C. F. WILLARD—
Curtiss, 50 Curtiss.

*J. J. FRISBIE—
Curtiss-type, 51 Hall-Scott.

*J. C. Turpin and *P. O. Parmalee qualified for pilot licenses. ‡Turpin did not fly officially. Eugene Ely had a Curtiss monoplane, but it was not flown officially. Harkness did not fly. *Walter Christie had a monoplane with two engines, but not entered in meet. All aeroplanes in the meet, except the Wrights, were equipped with Bosch ignition.

* Americans.

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OFFICIAL RESULTS TABULATED

C. GRAHAME-WHITE.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 22—				
1st Hrly Dist	$250	50.0K	57:37.20	1
2nd Hrly Dist	250	47.5K	56:22.00	1
Daily Tot Dur	500	.....	2:00:00.00	1
October 24—				
1st Hrly Dist	....	50.0K	55:18.20	5
2nd Hrly Dist	$100	52.5K	57:58.20	2
Daily Tot Dist	250	.....	1:56:48.80	2
October 25—				
1st Hrly Dist	$100	5.0K	6:37.55	2
2nd Hrly Dist	250	35.0K	31:16.85	1
Daily Tot Dur	....	.....	41:48.05	5
October 26—				
Special Dist	....	20.0K	18:04.75	4
October 29—				
Gordon Bennett	$5,000	100.0K	1:01:04.74	1
October 30—				
Hourly Dist	....	27.5K	17:00.09	5
Daily Tot Dur	....	.....	18:24.23	5
G'd Speed M'plane	No prize	25.0K	14:56.13	1
Passenger carrying (Carried 326½ lbs.)	$400	5.0K	6:04.05	2
Statue of Liberty	....	32.8M	35:21.30	2
October 22-30—				
Total Dur	$1,000	.....	4:57:01.08	3
Total Dist	1,000	267.5K	.....	2
Fastest Flight	1,500	10.0K	6:02.16	1
October 31—				
Speed Race	$3,000	25.0K	14:34.40	1
Total Winnings	$13,600			

HUBERT LATHAM.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 24—				
1st Hrly Dist	....	12.5K	11:04.85	6
2nd Hrly Dist	$250	52.5K	47:56.40	1
Daily Tot Dur	....	.....	59:03.25	6
October 25—				
1st Hrly Dist	$250	47.5K	57:31.00	1
2nd Hrly Alt	50	3772ft	.....	3
Daily Tot Dur	100	.....	1:00:00.00	3
October 26—				
Cross Country	$250	20.0M	32:14.71	2
Special Dist	250	42.5K	36:22.45	1
October 27—				
Hrly Dist	$250	35.0K	55:24.15	1
Daily Total Dur	283.33	.....	1:00:00.00	..
October 28—				
1st Hrly Dist	$250	10.0K	14:00.25	1
2nd Hrly Dist	250	30.0K	43:59.40	1
Daily Tot Dur	250	.....	1:11:34.60	2
October 29—				
Gordon Bennett	....	100.0K	5:47:53.41	4
October 30—				
Hrly Dist	$250	82.5K	58:48.41	1
Daily Tot Dur	500	.....	58:51.74	1
October 22-30—				
Total Dur	$1,500	.....	5:09:29.59	2
Total Dist	1,500	270.0K	.....	1
Grand Alt	....	3772ft	.....	7
Fastest Flight	1,000	10.0K	6:26.07	2
October 31—				
A. C. A. Dist	$1,000	87.5K	1:04:36.00	2
Total Winnings	$8,183.33			

JOHN B. MOISANT.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 22—				
1st Hrly Dist	$100	35.0K	51:02.40	2
2nd Hrly Dist	100	35.0K	19:32.10	2
Cross Country	500	20.0M	39:41.80	1
Daily Tot Dur	250	.....	1:42:16.80	2
October 25—				
Cross Country	$250	20.0M	58:25.95	2
October 29—				
Gordon Bennett	....	100.0K	1:57:44.85	2
October 30—				
Hourly Dist	$100	70.0K	54:34.05	2
Daily Tot Dur	250	.....	54:56.85	2
Statue of Liberty	10,000	32.8M	34:38.84	1
October 22-30—				
Total of Dur	....	.....	2:37:07.65	5
Total of Dist	....	140.0K	.....	4
Fastest Flight	....	10.0K	7:28.09	6
October 31—				
A. C. A. Dist	$2,000	135.0K	1:43:23.80	1
Total Winnings	$13,550			

ARCH HOXSEY.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 22—				
1st Hrly Alt.	$250	742ft	.....	1
2nd Hrly Alt	250	673ft	.....	1
Daily Tot Dur	100	.....	34:35.40	3
October 24—				
1st Hrly Dist	....	52.5K	57:10.60	4
2nd Hrly Dist	....	47.5K	55:20.00	4
Daily Tot Dur	$500	.....	1:57:13.20	1
October 25—				
1st Hrly Alt	$100	5796ft	.....	2
2nd Hrly Alt	100	4882ft	.....	2
Daily Tot Dur	375	.....	2:00:00.00	..
October 26—				
Special Alt	$250	6233ft	.....	1
October 27—				
Hrly Alt	$100	6903ft	.....	2
Daily Tot Dur	283.33	.....	1:00:00.00	..
October 28—				
1st Hrly Alt	$250	6705ft	.....	1
Daily Tot Dur	100	.....	57:33.25	3
October 29—				
1st Special Alt	$500	5146ft	.....	1
2nd Special Alt	500	4644ft	.....	1
October 22-30—				
Grand Alt	$250	6903ft	.....	4
Fastest Flight	....	10.0K	10:16.40	11
Total Dur (And Amateur Cup)	3,000	.....	6:29:21.85	1
Total Dist	....	100.0K	.....	5
Total Winnings	$6,908.33			

RALPH JOHNSTONE.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 24—				
1st Hrly Dist	$ 50	52.5K	56:43.00	3
2nd Hrly Dist	....	45.0K	46:52.80	5
Daily Tot Dur	100	.....	1:47:44.40	3
October 25—				
1st Hrly Alt	....No barograph			3
2nd Hrly Alt	$250	7303ft	.....	1
Daily Tot Dur	375	.....	2:00:00.00	..
October 26—				
Special Alt	$100	5813ft	.....	2
October 27—				
Hrly Alt	$250	8471ft	.....	1
Daily Tot Dur	283.33	.....	1:00:00.00	..
October 29—				
1st Special Alt	$250	3235ft	.....	2
2nd Special Alt	250	1091ft	.....	2
October 22-30—				
Total Dur	$500	.....	4:17:14.40	4
Total Dist	....	97.5K	.....	6
Grand Alt	2,000	8471ft	.....	1
Fastest Flight	....	10.0K	10:08.00	10
October 31—				
Special Grand Alt	$5,000	9714ft	.....	1
Total Winnings	$9,108.33			

EMILE AUBRUN.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 24—				
1st Hrly Dist	$100	67.5K	48:10.65	2
2nd Hrly Dist	50	50.0K	35:53.40	3
Daily Tot Dur	....	.....	1:26:51.55	4
October 26—				
Cross Country	$500	20.0M	28:08.75	1
October 30—				
Hrly Dist	....	30.0K	21:13.35	4
Daily Tot Dur	....	.....	21:13.35	4
Gr Sp M'pl Elim	No prize	25.0K	16:37.05	2
Cross Country	$250	20.0M	21:52.50	2
October 22-30—				
Total Dur	....	.....	1:48:04.90	6
Total Dist	$500	147.5K	.....	3
Fastest Flight	500	10.0K	6:50.00	3
October 31—				
Speed Race	$500	25.0K	16:37.00	3
Total Winnings	$2,400			

COUNT DE LESSEPS.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 22—				
2nd Hrly Dist	$100	628ft	.....	2
Daily Tot Dur	....	.....	3:47.80	5
October 24—				
1st Hrly Alt	$250	5615ft	.....	1
Daily Tot Dur	....	....	27:24.80	7
October 25—				
1st Hrly Alt	$250	6931ft	.....	1
Daily Tot Dur	....	....	46:05.80	4
October 26—				
Cross Country	Did not round the balloon			4
Special Alt	$50	2549ft	.....	3
October 28—				
1st Hrly Dist	$50	2.5K	2:36.35	3
2nd Hrly Alt	100	2240ft	.....	2
Daily Tot Dur	....	.....	17:21.45	4
October 30—				
Passenger carrying (Carried 356½ lbs)	$1,000	5.0K	5:12.15	1
Statue of Liberty	....	32.8M	39:38.50	3
October 22-30—				
Total Dur	....	.....	1:34:39.85	8
Total Dist	....	2.5K	.....	16
Grand Alt	500	6931ft	.....	3
Total Winnings	$2,300			

A. J. DREXEL.

October 22—				
1st Hrly Dist	$50	25.0K	19:39.80	3
2nd Hrly Alt	50	519ft	.....	3
Daily Tot Dur	....	.....	20:31.80	4
October 24—				
1st Hrly Dist	$250	70.0K	54:33.40	1
2nd Hrly Alt	250	7105ft	.....	1
Daily Tot Dur	....	.....	1:02:16.20	5
October 26—				
Cross Country	$100	20.0M	43:07.75	3
October 29—				
Gordon Bennett	....	35.0K	26:04.08	6
October 22-30—				
Total Dur	....	.....	1:22:48.00	9
Total Dist	....	95.0K	.....	7
Grand Alt	$1,000	7105ft	.....	2
Fastest Flight	....	10.0K	7:31.20	7
October 31—				
Special Grand Alt	....	8373ft	.....	2
Total Winnings	$1,700			

J. A. D. McCURDY.

October 24—				
Gr Sp Bip Elim	No prize	25.0K	19:49.20	1
October 25—				
2nd Hrly Dist	$100	30.0K	24:13.35	2
Daily Tot Dur	....	.....	23:09.85	7
October 30—				
Hrly dist	$50	45.0K	32:35.99	3
Daily Tot Dur	100	.....	32:37.16	3
Special Dist	100	15.0K	14:13.30	2
October 22-30—				
Total Dur	....	.....	55:47.01	10
Total Dist	....	75.0K	.....	8
Fastest Flight	....	10.0K	7:06.95	4
October 31—				
Speed Race	$1,000	25.0K	21:04.20	2
Total Winnings	$1,350			

JAMES RADLEY.

October 24—				
2nd Hrly Dist	....	5.0K	3:38.20	6
Daily Tot Dur	....	.....	4:15.80	10
October 25—				
Cross Country	$500	20.0M	19:48.45	1
October 29—				
Gordon Bennett	Up but for		5:43.28	
October 30—				
Hrly Alt	$50	614ft	6:19.49	3
Daily Tot Dur	....	.....	6:19.49	8
Special Dist	250	25.0K	17:32.45	1
Grand Speed Monoplane Elimination	No prize	5.0K	3:20.77	4
Cross Country	$500	20.0M	20:05.60	1
October 22-30—				
Total Dur	....	.....	11:05.29	13
Total Dist	....	5.0K	.....	14
Grand Alt	....	614ft	.....	11
Total Winnings	$1,300			

P. O. PARMALEE.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 26—				
Special Dist	$100	40.0K	57:37.03	2
October 28—				
1st Hrly Alt	$100	3819ft	.....	2
2nd Hrly Alt	250	3636ft	.....	1
Daily Tot Dur	500	.....	1:40:25.40	1
October 22-30—				
Total Dur	....	.....	1:40:25.40	7
Grand Alt	....	3819ft	.....	6
Total Winnings	$950			

RENE SIMON.

October 25—				
2nd Hrly Dist	....	10.0K	7:23.50	4
Daily Tot Dur	....	.....	7:23.50	8
October 26—				
Special Dist	....	15.0K	11:40.90	5
October 30—				
Hrly Alt	$250	959ft	11:20.80	1
Daily Tot Dur	....	.....	11:20.80	6
Gr Sp Mpl Elim	No prize	25.0K	16:54.80	3
October 22-30—				
Total Dur	....	.....	18:44.30	12
Total Dist	....	10.0K	.....	11
Grand Alt	....	959ft	.....	8
Fastest Flight	....	10.0K	7:23.50	5
October 31—				
A. C. A. Dist	$500	60.0K	50:13.00	3
Total Winnings	$750			

WALTER BROOKINS.

October 24—				
1st Hrly Dist	....	7.5K	5:30.85	7
1st Hrly Alt	$100	4882ft	.....	2
Daily Tot Dur	....	.....	5:30.85	9
October 26—				
Special Dist	$50	30.0K	22:40.80	3
October 27—				
Special Alt	$250	742ft	.....	1
October 22-30—				
Total Dur	....	.....	5:30.85	17
Total Dist	....	7.5K	.....	12
Grand Alt	....	4882ft	.....	5
Total Winnings	$400			

EUGENE ELY.

October 22—				
1st Hrly Alt	$100	404ft	.....	2
2nd Hrly Alt	....	206ft	.....	4
October 24—				
1st Hrly Alt	....	412ft	.....	4
October 30—				
Hrly Dist	....	10.0K	8:20.81	6
Daily Tot Dur	....	.....	8:20.81	7
October 22-30—				
Total Dur	....	.....	8:20.81	11
Total Dist	....	10.0K	.....	10
Grand Alt	....	412ft	.....	12
Fastest Flight	....	10.0K	8:20.81	8
Total Winnings	$100			

CHAS. F. WILLARD.

October 24—				
1st Hrly Alt	$50	629ft	.....	3
Daily Tot Dur	....	.....	6:36.80	8
October 30—				
Special Dist	50	5.0K	5:22.35	3
October 22-30—				
Total Dur	....	.....	6:36.80	15
Grand Alt	....	629ft	.....	10
Total Winnings	$100			

C. AUDEMARS.

October 28—				
1st Hrly Dist	$100	2.5K	2:24.50	2
Daily Tot Dur	....	.....	2:21.50	5
October 22-30—				
Total Dur	....	.....	2:24.50	19
Total Dist	....	2.5K	.....	15
October 31—				
Sp Dem Race	No prize	7.5K	6:05.20	1
Total Winnings	$100			

J. C. MARS.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 24—				
Gr Sp Bip. Elim	No prize	25.0K	22:54.15	2
October 25—				
2nd Hrly Dist	$50	30.0K	30:47.40	3
Daily Tot Dur	....	.....	31:15.10	6
October 26—				
Special Dist	....	2.5K	2:02.80	6
October 22-30—				
Total Dur	....	.....	31:15.10	11
Total Dist	....	30.0K	.....	9
Fastest Flight	....	10.0K	8:40.55	9
October 31—				
A. C. A. Dist	....	2.5K	2:21.80	4
Speed Race	....	Did not start		
Total Winnings	$50			

ALFRED LE BLANC.

October 25—				
2nd Hrly Dist	....	7.5K	5:18.85	5
Daily Tot Dur	....	.....	5:37.50	9
October 26—				
Cross Country	Did not round the balloon			
October 29—				
Gordon Bennett	....	95.0K	52:49.70	5
October 22-30—				
Total Dur	....	.....	5:37.50	16
Total Dist	....	7.5K	.....	13

Note.—In the above schedule K equals kilometers, M equals miles. Time is expressed in hours, minutes, seconds, and hundredths of a second. Only distances actually covered by each contestant in each contest is given, not necessarily the distance to be covered under the rules.

In these figures "total distance" and "total duration" do not mean exactly what the words say. Only time and distance in the "hourly" distance, duration and altitude contests counted in the grand total. Time up in "special altitude" or "special distance" contests did not count for totalization.

The Mechanics' Prize was not awarded, as the aviators failed to furnish a list of their mechanics under the rules. Total winnings in the meet, $63,249.99. The Wright Company was paid $25,000 for the license. The amount of "expenses" allowed contestants is not known.

RENE BARRIER.

CONTEST	WON	DIST. MADE	TIME	POSITION
October 30—				
Hrly Alt	$100	932ft	3:35.10	2
Daily Tot Dur	....	.....	3:35.10	9
October 22-30—				
Total Dur	....	.....	3:35.10	18
Grand Alt	....	932ft	.....	9
Total Winnings	$100			

ROLAND GARROS.

October 31—				
Spec Dem Race	No prize	5.0K	4:02.20	2

ALEC. OGILVIE.

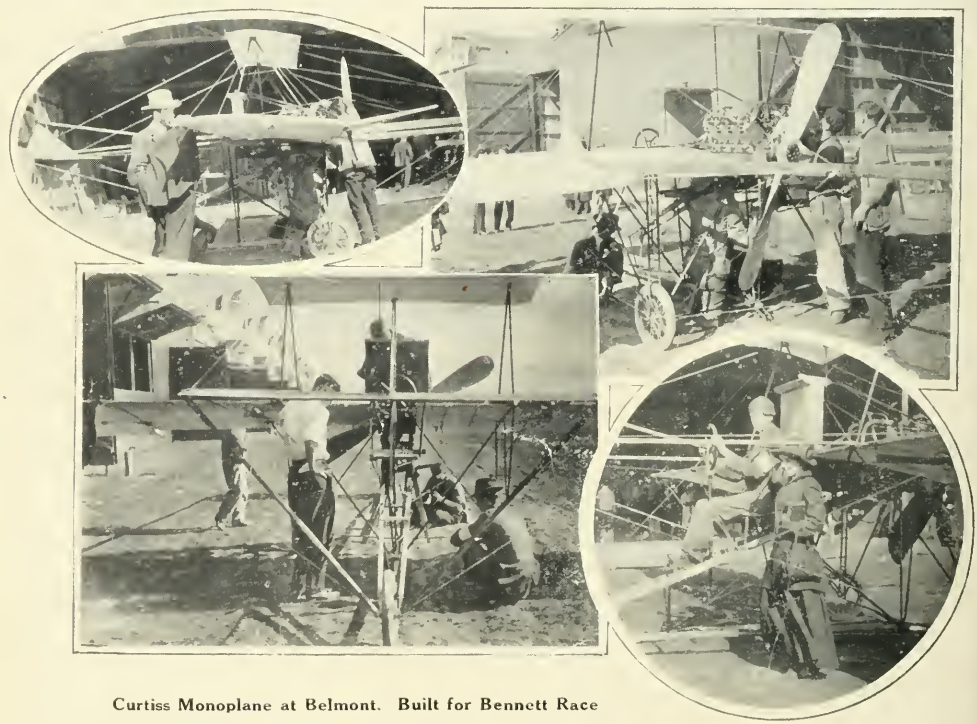
October 29—				
Gordon Bennett	....	100.0K	2:06:26.69	3

J. J. FRISBIE.

October 24—				
Gr Sp Bip Elim	No prize (Smashed up on 3rd round)	5.0K	4:30.21	

CHAS. K. HAMILTON.

October 29—				
Gordon Bennett	Did not finish a lap			



Curtiss Monoplane at Belmont. Built for Bennett Race

Until the last moment before the meet, it seems, none of the Curtiss aviators expected to be present. Almost the last thing before the meet opened expense money was guaranteed and the aviators hustled to get their machines to the track. But one of the machines had tanks large enough to go after hourly distance and duration prizes, nor could any make the speed of the Bleriots, unless perhaps McCurdy's, which had special light Naiad cloth both sides of the planes and flatter ribs than standard. The wind, too, was against Mars, Ely, McCurdy and Willard. The Curtiss machines have more surface than the Bleriots. At fast speed a large machine feels the force of the wind more, it is claimed, the theory working out that a small machine at fast speed is equivalent to a large machine at slow speed, as far as wind trouble is concerned; but large surface and fast speed both make the machine very susceptible to variations in the wind.

The Dependable Quality of the

F & S

Annular Ball Bearings

is emphasized by the following recent performances

International Aviation Tournament—Belmont Park

GNOME MOTORS

7-Cylinder, 50 H. P. and 14-Cylinder, 100 H. P., were used on

BLERIOT MONOPLANES BY

LE BLANC, DE LESSEPS, GRAHAME-WHITE, MOISSANT, DREXEL, AUBRUN, SIMON, BARRIER AND RADLEY

Winning the

JAMES GORDON BENNETT INTERNATIONAL CUP

for the fastest 100 kilometer flight—World's Record—the $10,000 Ryan Prize

STATUE OF LIBERTY FLIGHT

and the majority of other events, besides the bulk of the Prize Money.

Gnome Motors are equipped with F. & S. Annular Ball Bearings all over, including the crank shaft and even the connecting rods, the latter a radical departure in foreign practice, the only American maker doing this being the makers of the winning Flying Merkel, the F. & S. ball bearing motor cycle. F. & S. Annular Ball Bearings—the Dependable Kind—increase the speed and stand the terrific strain of the fast revolving, air-cooled Gnome Motors as demonstrated at every aviation meet.

Bleriot Motors Revolutionize Science of Aviation, Bishop Says

"The showing made by the Bleriot motors revolutionizes the science of aviation," Mr. Courtland Field Bishop said last night. "It has been proved that this type of engine is superior to anything of the kind in the world.

"I regret exceedingly the mishap which caused the wreck of the Wright racer, but even so I am very much in doubt whether this type of motor could have made the same showing as the Bleriot motor, even had the accident not happened."

Gnome Motors Superior to All Others, Mr. Bishop Says

"I repeat that to my mind the result establishes the superiority of the Gnome motor over all others. It is a question whether Mr. Curtiss would ever have won the trophy at Rheims at all, but for the fact that Bleriot, at that time, used an Anzani motor.

"If the American team had come out early they might have accomplished something. As it was, they had no chance against the Gnome motor."—*Brooklyn Daily Eagle.*

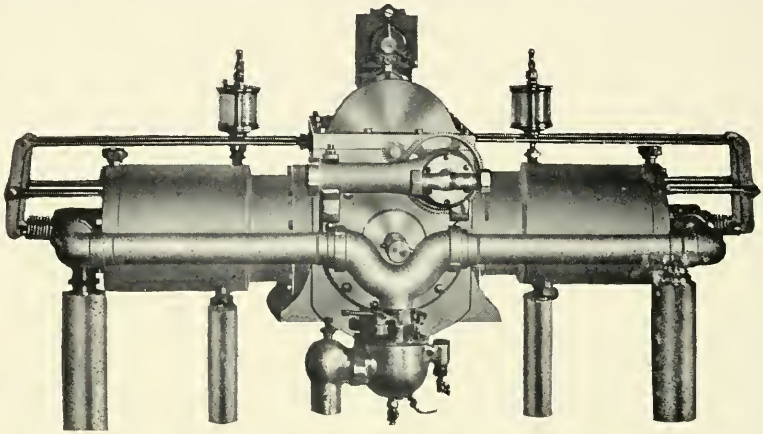
J. S. BRETZ COMPANY, Sole Importers

Times Building, New York

The CALL AVIATION ENGINE

STANDARD OF

Light Weight Motor Excellence



The Sensation of the "International Aviation Tournament," New York City, and the "Three-States Aero Show," Philadelphia, Pa.

As Light as the Lightest of Aviation Engines
As Strong as the Strongest of Automobile Engines

¶ Especially designed and constructed for permanent hard duty. This is the engine you are looking for; it is the engine you will eventually adopt.

MODEL E-1: Two Cylinder; 50 Horsepower, weight, 175 lbs. - Price $1,000
MODEL E-2: Four Cylinder; 100 Horsepower, weight, 325 lbs. - Price $2,000

Prices include complete equipment, No Extras
COMPLETED ENGINES IN STOCK

¶ *Write* for particulars and price of our *Reversible Aerial Propeller.* Also of our *Combination Radiator and Heater,* constructed of aluminum tubing. Utilize the heat of your engine for the comfort of your passengers. Weight two pounds per gallon of jacket water.

SEND FOR CATALOG C3

We employ no agents; we cannot afford agents' commissions at these prices.

The Aerial Navigation Company of America

GIRARD, KANSAS

Object to Gordon Bennett Course.

Previous to the running of the Gordon Bennett many objections were made by the foreign contestants to the course, which was claimed to be dangerous and not at all in accordance with requirements for safety demanded by the international federation. This course came very close to houses and other buildings and trees, and was over very uneven ground. Upon the demand of the French competitors several minor dangers were removed, such as trees. M. Gasnier, the delegate of the French club to the contest, has issued a letter stating that he complained of conditions to Cortlandt F. Bishop and found his objections coincided with those of the club president, who it is reported by M. Gasnier, had "kicked" without result to the aviation committee of the meet.

It is believed that since the meet the course has been surveyed by representatives of one of the French contestants. Whether any formal protest will be made remains to be seen.

Royal Aero Club Protests.

On November 15th the Royal Aero Club warned the Aero Club of America by cablegram that it was protesting the award made to Moisant in the Statue of Liberty contest to the international federation. This body will not meet for nearly a year now, and it is possible the prize may be held up windy indeed and no flights could be made. The meet was advertised to end Sunday night, the 30th of October. To make good to the public for the bad Sunday, the meet was continued on Monday, the 31st.

Previous to the 30th it was not clearly determined whether the first Sunday's program would be carried out officially on the 31st or not. Someone of the management brought up a clause of the F. A. I. rules, which provided that official events must end on the date advertised as the finish of the meeting, or Sunday, the 30th. Therefore, in announcing to the aviators the schedule for the 31st it was stated in the bulletins that this day's contests were special ones for special prizes. The aviators had this bulletin Saturday night or Sunday morning.

When Graham-White found the Statue of Liberty race had been awarded to Moisant, he protested and desired to try for it again on Monday, the added day. He was advised that this was impossible, but that if he liked he could make the same flight, with all officials for timing and so forth, as a basis on which he might make an appeal to the F. A. I. if he so liked. White did not accept this offer.

Drexel, who did not compete for this prize, took White's part and protested against the alleged unsportsmanlike conduct of the race by the management in letters to the newspapers.

On November 1 the Aero Club of America held a meeting of its governors and considered the public

	MAKE	SURF.	MOTOR*	COOLED	PROPELLER		RADIATOR	TIRES	CLOTH	IGNITION	WEIGHT	LANDING DEVICE
OGILVIE	Wright	145	30.6 4cyl	Wright	Water	Wright	———	Wright	Hartford	———	Mea	610 lbs.	Skid & 4 wheels
BROOKINS	Wright	480	30.6 4cyl	Wright	Water	Wright	9' about	Wright	Hartford	———	Mea	826 lbs.	Skid & 4 wheels
JOHNSTONE	Wright	480	30.6 4cyl	Wright	Water	Wright	9' about	Wright	Hartford	———	Mea	826 lbs.	Skid & 4 wheels
HOXSEY	Wright	184	30.6 4cyl	Wright	Water	Wright	———	Wright	Hartford	———	Mea	670 lbs	Skid & 4 wheels †
PARMALEE	Wright	145	6.12 8cyl	Wright	Water	Wright	———	Wright	Hartford	———	Mea	780 lbs.	Skid & 6 wheels
MARS	Curtiss	224	5.12 8cyl	Curtiss	Water	Curtiss	6' × 6'	El Arco	Diamond	Baldwin	Bosch	600 lbs	3 Wheels
ELY	Curtiss	224	5.12 8cyl	Curtiss	Water	Curtiss	6' × 6'	El Arco	Hartford	Baldwin	Bosch	600 lbs.	3 wheels
MCCURDY	Curtiss	224	5.12 8cyl	Curtiss	Water	Curtiss	6' × 6'	El Arco	Goodrich	Naiad	Bosch	600 lbs.	3 wheels
WILLARD	Curtiss	304	5.12 8cyl	Curtiss	Water	Curtiss	7½' × 5½'	El Arco	Goodrich	Baldwin	Bosch	700 lbs.	3 wheels
HAMILTON	Curtiss Type	259	61 8cyl	Christie	Water	Chelsea	8' × 9'	A-Z	Goodyear	Baldwin	Bosch	1000 lbs	3 wheels
" †	Curtiss Type	224	5.12 8cyl	Hall-Scott	Water	Chelsea	6' × 7'	H-S	Goodyear	Goodyear	Bosch	600 lbs.	3 wheels
BALDWIN	Bodle-Curtiss Type	300	5.12 8cyl	Curtiss	Water	Gibson	7' × 6'	El Arco	Goodrich	Baldwin	Bosch	750 lbs.	3 wheels
SHRIVER	Curtiss Type	300	30 6cyl	Kirkham	Water	Chelsea	7' × 4½'	El Arco	Penna.	Baldwin	Bosch	800 lbs	3 wheels
FRISBIE	Curtiss Type	224	5.12 8cyl	Hall-Scott	Water	H-S	7'6" × 5'	El Arco	Hartford	Baldwin	Bosch	640 lbs.	3 wheels

† Christie motor rated by maker at 110 hp.; Hall-Scott at 80. * A.L.A.M. rating. † Altitude machine. Wright radiators vertical tube El Arco and A-Z honeycomb type. Only other American made machine, Ely's Curtiss Mono.

American-Built Machines at Belmont

all that time. Graham-White forwarded a statement of his view of the contest to his own club, together with a copy of the rules. There was much friction between aviators and the aviation committee, but after the meet everything seemed to have been forgotten and buried. White himself said he had nothing to say as to his treatment, except on one point, and that was the constant changes in the rules covering the various contests.

The Aero Club of America disclaims any connection with the Belmont meet, except the Gordon Bennett race. All other events of every kind were under the control of the tournament, which was financed and handled by the Aero Corporation, Limited, a stock company, with $500 capital stock. The directors named in the certificate of incorporation are Cortlandt F. Bishop, Charles Jerome Edwards, A. H. Forbes, Samuel H. Valentine and Alan R. Hawley. The stock in this company is supposed to be turned over to the membership corporation, Aero Club of America.

It is a question whether any aero body in this country has affiliation with the F. A. I. The Aero Corporation, Ltd., is the legal successor of the original stock company, the Aero Club of America, which signed the affiliation agreement. The Aero Corporation, having no membership, cannot rightfully be a representative and comply with the terms of the agreement. If the new Aero Club of America, membership corporation, has not made a new agreement, it would seem that there is no accredited representative in this country.

The Cause for the Protest.

A schedule of events was announced for the second day of the meet, Sunday, October 23, as well as for the remaining days. This day was very

protest of Drexel, who was one representative of the club in the Gordon Bennett but did not complete the course, and the matter of asking his resignation and cancelling his pilot license was also taken up. During the meeting Drexel's resignation was received, handed in on his own account. This was laid on the table.

On the night of the 31st, while the Aero Club was holding its dinner to the aviators, Drexel had a little dinner of his own at another hotel, coming to the club dinner later in the evening with the other aviators and Graham-White, who was presented with the Gordon Bennett trophy for his own club. This opposition dinner created no little comment on the part of club members as to the discourtesy shown the meet management and the club.

The point at issue seems to be whether or not the meet officially closed on the 30th. If there is a clause in the international rules covering this point, as the management claims, then there seems to be no reason for complaint, unless the aviators had not proper notice of this on Sunday, the 30th.

This statement was made by the board concerning Mr. Drexel:

> Charges are being prepared against J. Armstrong Drexel in connection with his conduct prior to the starting in the Gordon Bennett international aviation cup race as a representative of the Aero Club of America, as well as his conduct in withdrawing from said race when having completed less than one-quarter of the distance; as well as the statements emanating from him and appearing in to-day's newspapers attacking the good faith and honor of the other members and officers of the club.

BALTIMORE AVIATION MEET

By R. F. Patterson.

Baltimore Results.

Duration.

Latham	3:53:31 1-5
Drexel	1:59:23 2-5
De Lesseps	1:55:47 3-5
Hoxsey	1:21:46 2-5
Ely	7:40 1-5
Willard	5:30
Radley	3:31 3-5

Cross Country (about 18 M.).

Drexel	23:34 4-5
De Lesseps	26:15
Latham	28:58

Bomb Dropping.

Latham	15 points
Drexel	6 points

Passenger Carrying.

De Lesseps	16:48 2-5

Altitude.

Hoxsey	5,330 ft.
Drexel	4,855 ft.
Latham	2,373 ft.
De Lesseps	1,722 ft.

Baltimore Sun $5,000 Prize.

Latham, only entrant, time 42:10 1-5, flight over the city of Baltimore.

The prize money was divided in a manner said to have been agreeable to the aviators, though not in accordance with the announced plan, owing to the many interferences of the weather with the programme during the meet.

THE Baltimore Aviation Meet, under the auspices of the B. & O. R. R. at Halethorp, a few miles outside of Baltimore, opened Nov. 2nd, just after the close of the Belmont meet. This gave the promoters a large number of aviators to select from. The men taking part were: Latham, De Lesseps, Radley, Drexel, C. F. Willard, Eugene Ely and Arch Hoxsey.

About 7,000 saw the first flights. Willard was amusing the crowd by pivoting about a particular pylon when someone caught sight of what he thought was an enormous bird flying for the grounds. It proved to be Radley flying over from where he had assembled his machine a mile off from the grounds. Willard kept on, and was in the air some twenty minutes. Ely raced Willard in a speed test, and later Drexel, Ely and Willard went up for altitude. After the shower, Drexel and Radley flew across country. After a large part of the crowd had gone and it was almost dark, Count de Lesseps appeared in the air. He also had flown over from the Pennsylvania station.

The next day it rained and snowed, and that evening a gale blew down the tents where eight or more machines were stored, letting the wet canvass and snow fall on top of the machines. Latham and Hoxsey were not able to get their machines to Baltimore in time for the opening day, so missed the disaster. The machines of Ely, Willard and Radley were damaged so much that they had to be entirely rebuilt.

On account of the storm, the meet was postponed until the week beginning November 6, and lasting up to the 12th. On the 6th Latham made his first flight in Baltimore. This lasted twenty minutes, and he had to fight a strong wind all the time. He made two other flights, in one going to 1,000 ft. Again, as most of the crowd had gone, Drexel made an altitude flight, the wind having subsided to almost a dead calm. He was up nearly out of sight, and the motor could not be heard any more. His descent was practically one long glide until within two hundred feet from the ground, when he made a long circle and landed near the grand stand from where he had ascended ten minutes before.

Hoxsey had assembled his four-cylinder "Baby" Wright at the Pennsylvania station during the morning of the 7th, and flew across to the field with the breeze behind him. He circled the grounds and was intending to land, but the wind had increased its speed so much, he was unable to land at the moment, and was forced to climb again to clear trees and make a second circle. Noticing a clear space, he endeavored to try a landing, without knowing the nature of the ground, which was being thawed out by the sun, and disregarding the speed of his machine, striking the ground so hard and at such speed, his wheels sticking in the mud, they folded back underneath, allowing the machine to go face down and roll over. Apparently Hoxsey had been thrown forward and clear of the machine when the wheels first struck.

Latham Flies Over Baltimore.

Contrary to general expectations, as the wind was strong, Latham went up and flew over Baltimore, after making two circuits of the course. The flight lasted 42 minutes, until he landed at the field. This won a $5,000 prize offered by a local newspaper. In the afternoon, Drexel, Count de Lesseps and Latham entertained the people with numerous flights.

The feature of the next day was the wind fighting of Hoxsey and Latham. The breeze threatened to blow over the sheds, as it did the tents the previous week. With the motor shut off, Hoxsey again broke his running gear in landing. When the wind had dropped somewhat, Drexel and De Lesseps came up and flew.

Hoxsey in Dangerous Glide.

On the 9th, in making a great altitude flight in the "Baby" Wright altitude machine, which he had not flown before until the Baltimore meet, Hoxsey met with an unfortunate landing. After reaching 5,330 ft., he noticed his engine missing fire, and started downward. Those who were watching closely noticed that he made a straight point downward for about 2,000 ft. and then began climbing again for another moment only. His engine had then stopped dead, and down he came at terrific speed, and at a very steep angle. All thought that he had lost control and would be dashed to pieces at the end of the 3,000 ft. drop. The small supporting surface on this machine makes it impossible for one to do more than to glide at a steep angle or travel on a parallel line at a fast rate. Hoxsey aimed for a farm about 1½ miles from the field, where he landed in a potato patch safely. He was running so fast that he was unable to stop until he had crossed a road and rolled into a wheat field with a plunge which eventually upset the machine on top of him, damaging it slightly. Fortunately Hoxsey received no injuries.

He came down so swiftly that few of the people present who saw him could follow his progress for any distance, and as a forest intervened between the farm and the aviation field, no one knew whether he was hurt or not until fully forty minutes later, when an auto brought him back to the grounds. Other flights were made that day by Latham, Drexel, De Lesseps, Ely, Willard and Radley. This was the best day thus far, four machines being in the air at once.

The 10th saw another storm, which cleared sufficiently for Latham, Drexel, De Lesseps and Radley to bring out their machines. De Lesseps carried several army and navy officers from Washington. Bomb throwing was the feature of the day, and caused much cheering and amusement until half past three, when Hoxsey was seen far off in the distance flying towards the field with one of the big machines which had been lost in transit. The Wright aviators seemed to be able to do with the big machines any form of flying common to the birds. The public also witnessed much the same flying by Willard in his famous "Banshee" (large-sized Curtiss), which was wrecked during the storm at Baltimore. This was Hoxsey's day, with his various spiral curves, sharp downward glides and hurdle jumping. Latham and Drexel did most of the bomb throwing, which interested the army and navy men exceedingly. At 4:30 on this day all the machines were rushed off the field in a great hurry as another storm came up. Two records were made. Latham bet McArdle, who is Drexel's partner, that he could go up in his machine and hit a target on the ground with a revolver. He made eight shots, and two hit the target, one in the inner circle. That meant some good work, for the wind was quite high. Count De Lesseps took an army officer in his monoplane,

(*Continued on page 218*)

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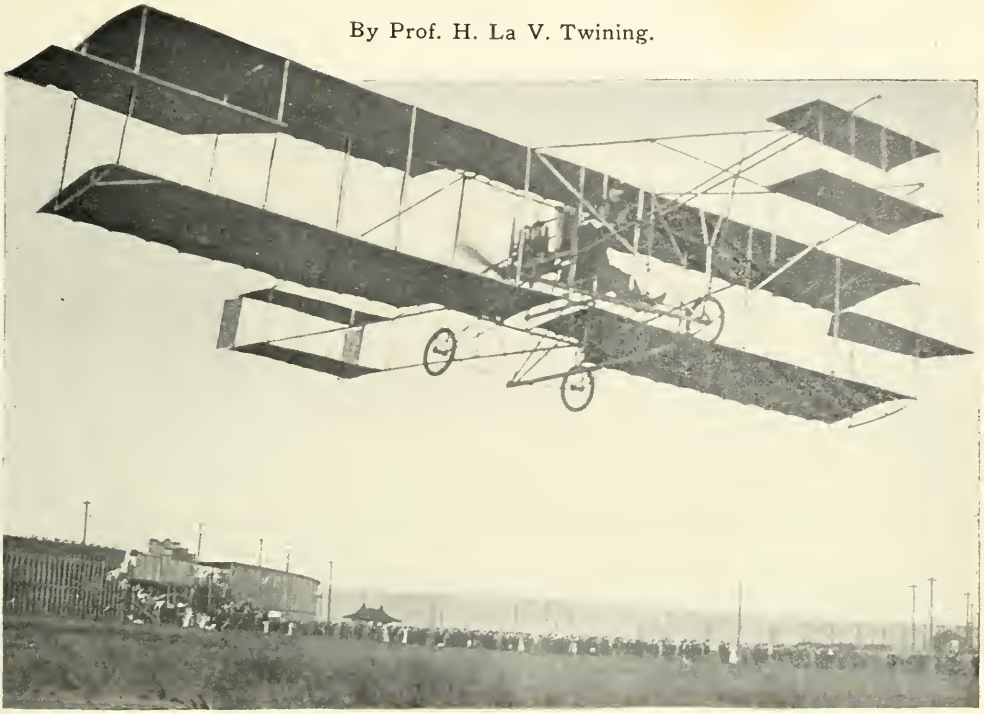

C. F. Walsh in Flight at Los Angeles

THE Novice meet of the Aero Club of California was held as scheduled, on the 22d and 23d of October at the Los Angeles aerodrome.

All machines without motors were wheeled out and lined up along the paddock. Saturday afternoon at 3 o'clock the program was opened by a towing flight by Jack Cannon. Considerable difficulty was experienced, owing to the lack of power on the part of the towing automobile. After several attempts, it was exchanged for a more powerful automobile, a Stoddard Dayton, 72 h. p., driven by Mortimer, a member of the club. Owing to rains some days previous the ground was slippery and complete circles were not made, but short flights were obtained. Inside the motordrome the other machines developed engine troubles and did not attempt to fly.

C. F. Walsh, J. J. Slavin and B. F. Roehrig had housed their machines in a tent outside of the circular track. At 4 o'clock Mr. Walsh wheeled out his machine and made a short flight of one minute.

After alighting he arose again and flew with the wind back to the starting point, making the same distance in half the time. His third flight lasted four and one-quarter minutes, during which time he made three circuits of the course, this being the first time that he had made a circular flight.

On the next day, Sunday, Jack Cannon made a good towing flight inside of the aerodrome, circling the course three times, remaining in the air three minutes. Outside of the aerodrome Mr. Walsh made two attempts for a quick start, leaving the ground in 150 ft. the first time, and 128 ft. the second time.

He made two other flights, remaining in the air 1½ minutes the first time, and 7 minutes the second time, encircling the course four times.

B. F. Roehrig failed to qualify as he did not get his machine ready in time.

J. J. Slavin brought his machine out of the tent. It was a new one and he had just finished it. Everything was apparently in trim. He started his engine and when the signal to let go was given, he rushed over the ground at a high speed and jumped into the air with ease. His machine went up rapidly but did not lose headway. It listed to one side, and, after reaching a height of some 35 ft., as estimated by the onlookers, it turned toward the listing side and came to the ground on a slightly uneven keel, breaking the running gear. The listing was caused by a defective arrangement of the lever controlling the tilting of the planes. Both Roehrig and Slavin have Elbridge engines.

Four cups were put up as prizes: The "Examiner" cup, for distance; the San Diego cup, for height; the Leonard-Smith cup, for flight in a circle, and the Whitley cup, for duration.

Forty per cent. of sixty per cent. of the gross gate receipts were to be distributed as cash prizes. When Slavin shot into the air many thought he had won the height prize, but the contest committee awarded it to Walsh on his flight of the day previous.

C. F. Walsh was awarded all of the cups, as he was the only one to make sustained flights. One hundred and sixty-one dollars were distributed in cash prizes, Mr. Walsh winning all of the first events and Mr. Slavin coming in for second events. Inside of the aerodrome Jack Cannon was awarded the prizes for towing flight including height, distance and duration.

Some 1,200 people were in attendance on the two days.

Although the novice meet was a small affair yet it was eminently successful both financially and otherwise. In a year the club members have made great progress, all of the flying being done by local members of the club.

On the following Sunday, Mr. Walsh made two neat flights in a 25 mile wind, making his turns skillfully and landing without accident. The Greer monoplane was brought out and towed by an automobile. It rose easily 20 ft. high when the towing rope broke loose. Mr. George Duesler was in the monoplane. The strong wind caused

(Continued on page 232)

MINOR MEETS AND EXHIBITIONS

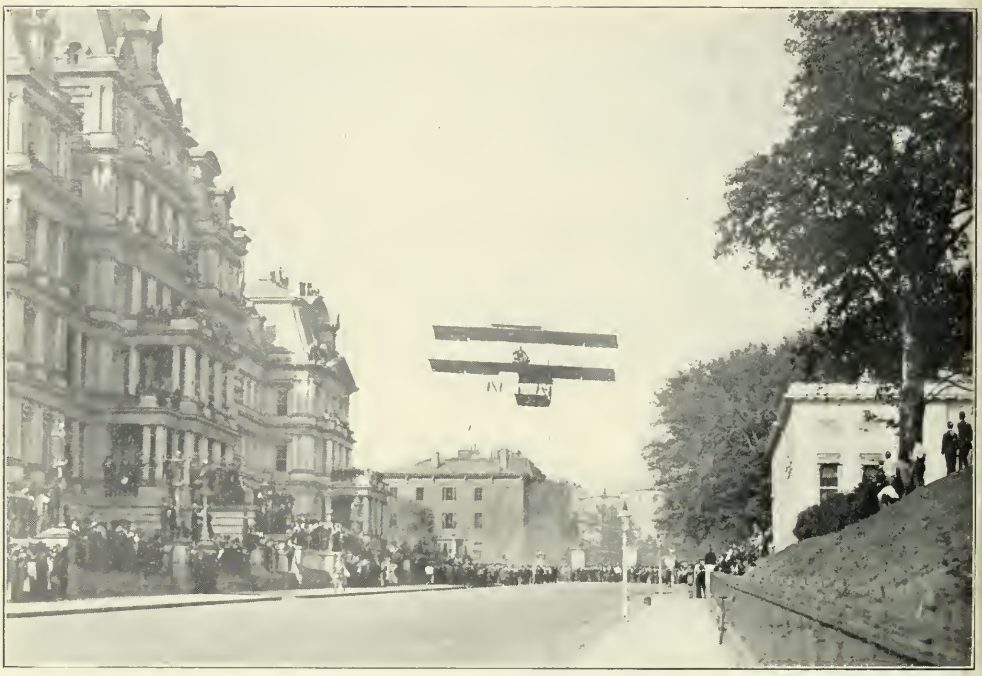

Photo by Courtesy of Major Geo. O. Squier

Start of White on his return to Benning after his remarkable trip from there to pay a visit to the offices of the War and Navy Dept., Oct. 14, 1910. Landing was from the southward, and from a high altitude, on the street shown in the picture and directly between the entrance to the Navy Dept. and the Executive Offices.

Big Meet for Los Angeles.

Los Angeles is to have a meet on January 9-19, now that Pasadena has given up her plans and offered the transfer of the sanction for the date Pasadena had named. At least $75,000 in prizes will be offered. It it made clear that this is to be a "gentlemen's meet," not a commercial proposition, with the representative men of the city back of it. Thus far, Radley, Hoxsey, Brookins, Mars, Willard, Post and McCurdy are to be counted on.

The San Francisco meet, with $103,000 all raised, is off—due to too many "promoters" and booking agents, it is claimed.

Moisant Starts Aerial Circus.

A. J. Moisant, brother of John B., the aviator, has started an aerial "circus," with Peter Young, Hamilton's manager, as ring-master. The "troupe" of flyers includes John B. Moisant, Charles K. Hamilton, who bought Aubrun's Bleriot; J. J. Frisbie, Rene Simon, Rene Barrier, C. Audemars and Roland Garros, the latter two flying Demoiselles. When "dates" are not obtainable they will land in a town and run their own show.

Gabriel Borel, who had contracts with Simon, Audemars and Barrier, is expected to bring suit in France. The three aviators are said to have "jumped" their contracts in joining the Moisant outfit. Borel, who is also manager for Leon Morane, will be back in February and open a school, probably on the Hempstead Plains.

Latham, Drexel and De Lesseps sailed for Europe on Nov. 16th.

Charles F. Willard and Tod Shriver left middle of November for California, Willard to Los Angeles and Shriver to San Francisco

Death of Johnstone.

While flying at Denver, Colo., together with Brookins and Hoxsey, Ralph Johnstone, the holder of the world's altitude record, and a famous trick bicyclist, met his death during a sensational exhibition of flight on November 17. Telegraph reports state that one wing, which had been repaired on the grounds, crumpled up, and the machine fell from a height of 500 ft., instantly crushing out the life of one of America's very best aviators. Mourning his loss is a wife and little boy and all those who knew him during his fearless life.

The three Wright aviators were filling the dates Nov. 17-22. Hoxsey was in the air at the same time and quickly brought his machine to the ground.

Over the infield after returning from a little cross-country flight, Johnstone pointed the nose of his machine downward for the spiral glide which has made the Wright flyers famous. While the cheers were still rising for his daring, the biplane seemed to check in its smooth course and flutter aimlessly for a moment. Johnstone was seen to be working his levers and trying to recover himself. Then the machine seemed to turn completely over.

More than 1,200 flights have been made this year by the Wright machines in this country and the only other injuries to aviators were to Brookins when he landed against the grand stand at Asbury Park and in his fall at Belmont.

William T. Thomas has been making good flights with his Curtiss-type biplane at the Rochester aviation field, with Walter Johnson as aviator. This machine is open for engagements. Address William T. Thomas, at Hammondsport, N. Y.

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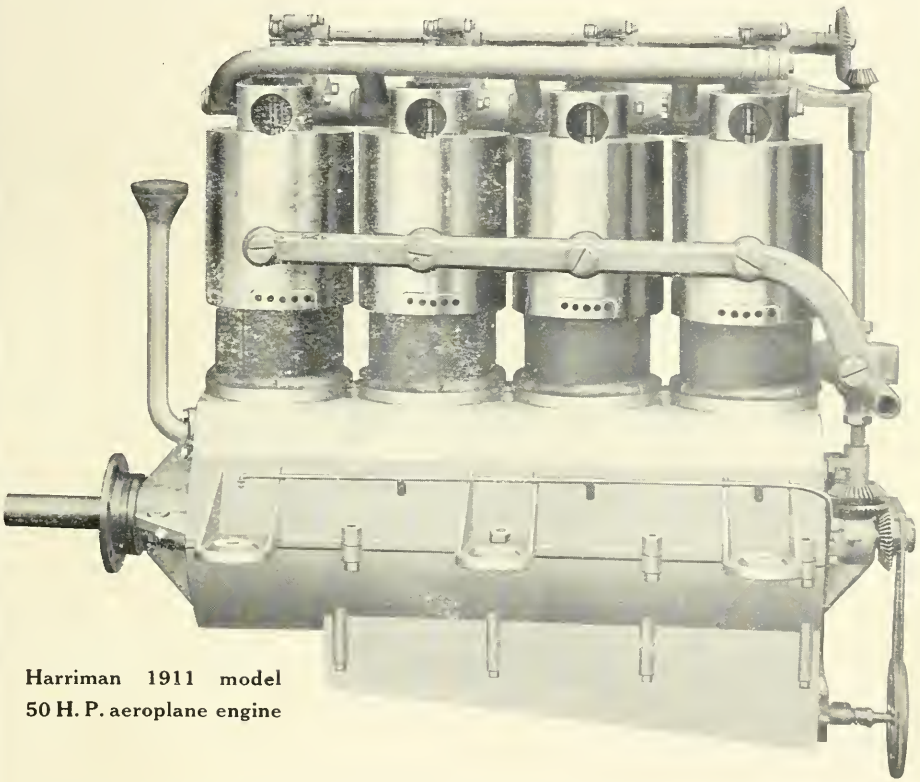

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ST. LOUIS, Oct. 8-16.—Aviation meeting of St. Louis Aero Club. The totalization for each aviator is as follows:

Hoxsey	(Wright)	9 hrs. 31	min., 29 flights
Welch	(Wright)	5 hrs. 27½	min., 15 flights
Brookins	(Wright)	5 hrs. 22½	min., 28 flights
Turpin	(Wright)	3 hrs 15½	min., 12 flights
Johnstone	(Wright)	2 hrs. 50	min., 12 flights
Ogilvie	(Wright)	1 hr. 46	min., 8 flights
Leblanc	(Bleriot)	1 hr. 32	min., 8 flights

Fastest speed was made by Leblanc, 67.9 m. p. h., or a mile in 53 sec.

CLEVELAND, OHIO, Oct. 12-16.—No flights were made the first day on account of weather conditions. Curtiss flew the 13th, which was quite a windy day, up and down the beach. Mars and Willard also flew on this day.

On the 14th Mars flew about 2,000 ft. high and 10 miles down the lake, out of sight. That was for a special prize offered by one of the local newspapers, the conditions being that he was to pass the breakwater down the lake; amount offered $500. Ely and McCurdy also made several flights.

On the 15th, the general flying was continued by Curtiss, McCurdy, Mars, Willard, and Post, who made two short flights. That was the last day of the official meet.

On Sunday, the City of Cleveland invited the men to stay and fly, giving a free exhibition. All fences were taken down and about three-quarters of the population attended. The banks along the lake front, about 150 ft. high, covered with grass, were made into a grandstand for probably one-quarter of a mile long, which was crowded with people anxious to see the flights. McCurdy flew out over the lake. Ely flew up over the city to an altitude of about 2,000 ft., so he could be seen from all parts of the city. He flew over the public square and the principal streets in the centre of the city. That flight was made complimentary to the Mayor. Mars made flights out over the lake. Post also made short flights. After the flights, the Mayor and city officials gave an informal reception to the aviators and congratulated them on their work.

WASHINGTON, D. C., Oct. 14.—Grahame-White flew from Bennings racetrack over the city, alighting in the street, at the Executive Offices. Start was made from the street and returned to Bennings. This was during a three-day exhibition at the racetrack by Harmon and White.

STREATOR, ILL., Oct. 15.—Willard flew one day.

SPRINGFIELD, MASS., Oct. 18.—Louis G. Erickson made three good flights.

FORT WAYNE, Oct. 22-23.—J. C. Mars and Miss Blanche Scott in Curtiss biplanes, two-day exhibition; successful flights.

MACON, GA., Oct. 28-Nov. 1.—Frank Coffyn and P. O. Parmalee (Wright) filled this date.

NORFOLK, VA., November 4.—Through the enterprise of a local daily paper, the Curtiss aviators gave the people of Norfolk and vicinity their first opportunity to see an aeroplane in flight on November 1 and 2. Lee Parade Ground, within the Jamestown Exposition grounds, was used as an aviation field, although rather small for the purpose. The meet was of the "common or garden variety," there being some very good flights, but nothing particularly spectacular. Mars was the star of the occasion, and did some very creditable flying in the famous "Hudson Flyer"; while McCurdy, tinkering around a balky 4-cylinder machine, kept the crowd in constant expectation of a race that never came off. An announced flight over Hampton Roads and the city was spoiled on the third and last day of the meet by stormy weather. While no records nor bones were broken, the people, with the exception of a few journalistic soreheads, seem to have been well pleased with the meet. The attendance was fairly good, about 16,000 people passing through the gates during the two days, not mentioning about 10,000 small boys who crawled under and climbed over or just "dropped in."

SHREVEPORT, LA., Nov. 4.—Stanley Vaughn (Curtiss) wrecked his machine in landing after an exhibition flight.

CHARLOTTE, N. C., Nov. 10-12.—J. A. D. McCurdy (Curtiss) was handicapped by bad weather and stayed over an extra day (the 12th), and made a series of successful flights.

PHILADELPHIA, PA., Nov. 17-24.—Clifford B. Harmon, J. A. Drexel and C. Grahame-White promised to fly between these dates. White made a number of flights at Point Breeze, crossing the Delaware River into New Jersey and over the navy yard, in his Farman. Drexel and Harmon flew also. White took up a number of passengers.

MOBILE, ALA., Nov. 21-24.—McCurdy and Post flew. This is Post's first flying since the balloon race. He got off the ground higher and made longer flights than he has ever made.

DENVER, COLO., Nov. 22.—Walter Brookins, Arch Hoxsey and Ralph Johnstone, the famous Wright aviators, and J. C. Mars were scheduled here beginning the 16th and ending to-day. The first day witnessed the terrible death of Johnstone during one of his sensational spirals. Hoxsey refused to be unnerved by the fatal accident to his brother aviator and continued flights the next day. Only one small accident marred the first day's flying, that being when Johnstone alighted the second time. He did not light quite straight to the course, and just as he nearly came to a standstill, his left wing caught in the fence, facing him around toward it.

The second day (17th) is the one on which Johnstone met his fate. He was in a particularly good humor, and said before he started that he would show them some stunts this time. He got off the ground very easily and rose to a pretty high altitude. He then started on a steep spiral descent. He made the first turn all right, but on the second something seemed to break. He lurched sidewise, and the machine plunged towards the ground. Even in the face of death Johnstone seemed to keep his head, as he was seen to crawl out on the opposite plane, and try to balance it. The machine crashed to the ground, pinning Johnstone underneath, where he was crushed to death. Hoxsey, who was in the air at the same time, flew over the wreck, but did not light. On the 20th Mars smashed his right wing on his third attempt at flight.

ROBERT A. DONALDSON.

The Curtiss machine, owned by James E. Plew, of Chicago, with Harriman 30 motor, has had a busy summer flying through the middle and far West, with J. J. Ward as aviator.

H. B. Odell, 13195 Euclid avenue, Cleveland, O., has purchased a "Demoiselle," with Clement-Bayard motor, and is looking for engagements. While these machines have not done any long flights, they are spectacular in the air.

Aero Calendar of the United States.

Nov. 16-17—Raleigh, N. C., McCurdy and Ely.

Nov. 23—Richmond, Va., Moisant, Hamilton et al.

Dec. 31-Jan. 7—New York Aero Show, Grand Central Palace.

Jan. 12-20—Los Angeles, Calif., big meet.

Feb. 20-25—Boston, Mass., second annual aero show.

March 6-13—Chicago, Ills., aero show.

New World Altitude Record.

PHILADELPHIA, Nov. 23.—A. J. Drexel (Bleriot) made a new world's altitude record at the Point Breeze track, of 9,970 ft., eclipsing Johnstone's height by 256 ft. He used the same barograph Johnstone had when he made his record. The officials neglected to replenish the ink and the record was not clear above 9,970 ft.

Death of O. Chanute.

Nov. 23.—Octave Chanute, the "father of aviation," died at his home, 1138 Dearborn Avenue, Chicago, Ill., to-day, aged 78 years, after a long illness, which he contracted while he was abroad. This is a mournful note to make as this issue is going to press.

DROPPINGS FROM THE BIRD MEN

CASTOR OIL of high grade is used for lubricating Gnome engines.

McCurdy's Curtiss has special Naiad cloth on both sides now. This is said to increase the speed of the machine some five or six miles an hour. Cables operating the ailerons on Curtiss machines are arranged differently than formerly, so that in case the cable to one aileron is broken the other aileron can still be operated in both directions. The ailerons are now hinged to the rear beam, top and bottom, and extend a little to the rear of the rear edge of the main surfaces. A light strut connects the upper and lower aileron on each side.

One of the new small Wright machines which Johnstone used in making his new world altitude record, with the 4-cylinder 30.6 h. p. engine (27 ft. 7 in. x 3 ft. 6 in.) climbed 1,230 ft. in 2 minutes and 48 seconds, a rate of 496 ft. a minute. This breaks all records for quick climbing. Orville Wright himself did this. Good climbing is 300 ft. a minute. Mr. Wright made in this same flight 750 ft. in 1:28, and actually 757 ft. in 1 minute flat. This machine is called by the Wrights the "light roadster."

The Belmont meet has brought out a number of good suggestions for future contests. In speed contests, while they bring out good flying, it is such an intricate problem for the public to keep track of the positions of the various machines that the real point of a race is lost to the spectator. Why not start a number of machines from the starting line, which must be long, at a certain moment (standing start), then race out to a balloon, say five miles or so away, and back. The first to cross the line to be the winner. The spectator would know at once how each machine stood as they neared the line. Wilbur Wright suggests a contest for rising in a given time, to prove the efficiency of a machine in this direction.

A recent editorial in American "Aero" cried down altitude contests as being particularly dangerous and showing nothing. This snap judgment appears too hasty. Altitude flights show strength in the machine, efficiency and perfection in control. Increasing power along with weight gains nothing but if the machine is so designed as to reach high altitudes without the increase in power, does it not show something? To each high altitudes one must have good, reliable power and an efficient machine.

The new engine in the Curtiss monoplane, 8 cylinders, 4½ x 4 in. (64.8 h. p., A. L. A. M. rating), pulled 380 lbs., holding at 360 lbs., a new Paragon propeller at 1,150 r. p. m.

Charles K. Hamilton has bought the Lovelace-Thompson monoplane which Leo Stevens was to have and is installing a Hall-Scott 8-cylinder engine, catalogued at 80 h. p.

The Emerson Engine Co. sold 15 of their 100-125 h. p. engines at their booth at Belmont.

In praising the winning of the Gordon Bennett by White, and the Statue of Liberty prize by Moisant, the newspapers forgot to call attention to the fact that the machines used were not English and American respectively, but French. Unfortunately this detracts considerably from the honor. Why not compete in international events with machines the product of the country, of which the aviator is a citizen. These events are really victories for the Bleriot machine and the Gnome engine rather than for the aviator himself.

The cylinders of the Gnome engine are practically 4¼ in. They figure out 50.5 h. p., A. L. A. M. rating.

The 8-cylinder Wright machine which Brookins had the ill luck to smash in the Gordon Bennett when four of the cylinders refused to fire, it is said, made 68 miles an hour in the one and only trial at Dayton, and not using all of the power. Eighty miles an hour is its probable capacity. It must go around 60 to get off the ground.

Alfred Leblanc is probably the very best aviator flying the Bleriot machine. Not all of the aviator's skill is in simply flying, but in starting and landing. Many of the smashes on the Belmont field were in landing.

Hamilton has a mirror mounted on his machine, set on a universal joint, so that he can see machines coming from behind.

Aeroplane tires with leather tread were seen on the Curtiss monoplane, made by the Diamond Rubber Co. These are for practice. For racing, very small Hartford "Aviator" tires on 12 in. wheels are to be used.

That aeroplane racing should be put in classes according to horsepower is a good scheme. What is the use of flying a 50-Bleriot against a 100-Bleriot. Not allowing for accidents the race is already run. Wilbur Wright urges that 40 to 50 horsepower ought to be the limit for racing, that 60 horsepower and over is dangerously high. Let improvement come in stability and control. The 30-horsepower Wright flies 60 miles an hour, alongside of the Bleriot 50-horsepower. In 1903 the Wrights lifted 750 lbs. with 12 horsepower, in their first machine. The present Wright does not do quite so well, as more power has been added to gain speed, and to have surplus power even with the engine missing. The small Wrights carry more weight, are stronger, faster and have more control than the 50-horsepower Bleriots. There is room for improvement in stability and control of all machines.

Hubert Latham seems to be the only one who has flown the Antoinette with any great success. One seldom hears of flights in this machine comparable to those of Latham. Everyone pronounced this machine the most beautiful of those seen at Belmont. Its flights were stately, but Latham could be seen working hard with his control wheels. The Antoinette machine uses pressure feed for the oil and gasoline.

Harry Harkness is installing an Emerson engine in his Antoinette, which was not seen in flight during the whole of the meeting.

Clothes at the Belmont Meet.—Hoxsey uses a black leather coat with fur lined combination leggins and boots which reach to the hips. Count de Lesseps adopted a single piece suit of coarse blue fabric, similar to overalls, with a cap that fitted close over the head, ears and neck. Graham-White wore knickerbockers with his peak cap worn hind side before, always. Brookins had a neat greenish cloth two-piece suit with the high-cut trousers very full in the stern and tight at the bottoms where they buttoned closely around the tops of the shoes. A pretty leather belt held the jacket close to the body. He had to have help to get his trousers buttoned up. Hamilton and some of the Curtiss men wore yellow leather jackets. Clifford B. Harmon looked very well in a full two-piece yellow leather suit with leather leggins and a huge pair of goggles.

The two Demoiselles, flown by Audemars and Garros, were the clowns of the meet. No meet is complete without them for they were more fun than all the rest of the flights put together. These two big bugs buzzed around the field once or twice every day, half the time on the ground and half off, but they constituted a whole show in themselves.

On more than ordinary windy days, and every day the wind blew fairly much, the flying opened on schedule time with one or two Wright machines; then later in the afternoon some of the Bleriots would be out. On one day it looked as though there would be no flying at all but Johnstone and Hoxsey went up just the same and later Latham brought out his Antoinette and a couple of Bleriots braved the gale. Johnstone and Hoxsey kept going high and higher until they got in a wind, which must have been blowing 70 miles an hour.

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(Los Angeles "Examiner," Oct. 23, 1910.)

"WALSH IS HERO OF BIG AERO CLUB CONTESTS

"Makes Splendid Flight Outside Motordrome

"Charles F. Walsh, of San Diego, was the hero of the first day of the aviation meet of the Aero Club of California at the Motordrome yesterday. He made a splendid flight outside the big enclosure, off toward Playa del Rey, circled around over the marsh back toward the motordrome and then circled over the same course again before alighting near the point where he took flight.******

"The young San Diegan displayed a high degree of skill in the control of his machine. His turns were gracefully made and as his aircraft was outlined against the sky and the hum of his motor floated to the spectators lining the top of the motordrome grandstand, memories of the good old days of the big meet came back and the enthusiasm stirred by Paulhan and Curtiss awoke again.

"The crowd cheered wildly in admiration of the Californian, an amateur, flying in a California built aeroplane, who had thus put himself in the real bird-man class.

"To-day, Walsh has the call on all the trophies offered for the big meet."

¶ It is reported that the only machine to leave the ground in the high altitude of Denver used an Elbridge Engine.

The first Novice flights on the Pacific Coast were made with Elbridge Engines.

The first novice flights, or any other kind, in New England, made with Elbridge Engines.

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More flights made with Elbridge Engines in America during 1910 than with all other makes combined.

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Wilbur Wright, G. H. Curtiss and others had to pay in order to get into the field at one time and to get passes to the sheds was like pulling teeth out of a chicken, for those who really had legitimate excuses for admittance thereto, while every day of the meet several hundred who had no particularly good reason for decorating that part of the field, seemed to have no trouble.

The "privileges" must have netted the management a considerable sum. The peanut man, cigar counter, pennant maker, rubber balloon vendor, chewing gum manufacturer, smoked glass magnate, lavatory trust, check room artist and others all paid flat sums of no very small amount. The bar privilege was worth between $5,000 and $10,000, and the man who rented 10-cent camp stools at 50 and 75 cents did a good business. The various exhibitors under the grandstand, of automobiles, propellers, engines, magnetos, etc., paid good money for a little space. The advertising in the program figured up around $7,000, of which the management got over half, and more than 70,000 of these were sold at 25 cents each. The passes and badges admitting lucky people to the sheds could be rented sub rosa at $5 per from enterprising holders. Then there was the man with the opera glasses for rental and the "aviation plumes." The lunch counter did an enormous business, with waiting men and women five deep. The grandstand seats got but little polishing as nearly everyone congregated on the lawn and walk in front.

Clifford B. Harmon, of Philadelphia, Pasadena and New York, mostly the latter, representing the Aero Club of America in his position as chairman of the executive committee of the "National Council of the Aero Club of America," is to be shelved, so the rumor goes, by both these conglomerations. Mr. Harmon is not supposed to be aware of this at all. Mr. Harmon has certainly been very active in the game. He owns one balloon, one aeroplane, one "freak" and two Gnome engines. He has given much time to actually piloting his balloon and his aeroplane, which is against all rules of etiquette of the indoor aero club.

Mlle. Marvingt (Antoinette) has been granted a pilot license. She is the third woman to hold this, the other two being Mme. de la Roche (Voisin) and Mme. Niel (Koechlin).

As early as 1909 Japan possessed an airship of a rather peculiar type, which, however, did not seem very suitable. Now a vessel on more up-to-date lines has been launched, which gives promise of better results. It is of the non-rigid type, and rather stumpy.

Roger Sommer has flown with two motors.

"Automobile Topics' aeronautic editor doesn't seem to know the difference between one aeroplane and another. He has a Curtiss machine, at Baltimore, labeled "Wright 'Baby'."

Southern Motoring—thanks very much!

Far be it from me to—anyway, even if C. William Wurster is a vegetarian, that doesn't stop the other members of the Cumberland nut club from eating meat.

Both Wright and Curtiss aeroplanes are now being offered for sale to the general public for pleasure purposes. Does anyone know anyone else, in the various alleged "aero clubs" of the country, who is going to be a real outdoor airman?

Correct List of Fatalities with Power Machines.

1908.

(1). Lieut. F. E. Selfridge, Sept. 17, Ft. Myer (Wright).

1909.

(2). Lefebvre, Sept. 7, Issy (Wright).
(3). Eneg Ronsi, Sept. 7, Rome (?).
(4). Capt. Ferber, Sept. 22, Boulogne-sur-Mer (Voisin).
(5). Fernandez, Dec. 6, Nice (Fernandez).

1910.

(6). Leon Delagrange, Jan. 4, Bordeaux (*Bleriot).
(7). Hubert Le Blon, Apr. 2, St. Sebastien (*Bleriot).
(8). Hauvette Michelin, May 13, Lyons (*Antoinette).
(9). Zosely, June 3, Budapest (Aviatik-German Farman).
(10). Thaddeus Robl, June 18, Stettin (Aviatik-German Farman).
(11). C. L. Wachter, July 3 (*Antoinette).
(12). Daniel Kinet, July 10, Ghent (Farman).
(13). Hon. C. S. Rolls, July 12, Bournemouth (Wright).
(14). Nicolas Kinet, Aug. 3, Brussels (Farman).
(15). Lt. Pasqua Vivaldi, Aug. 20, Rome (Farman).
(16). Clement Van Maasdyck, Aug. 27, Flushing (Sommer).
(17). Edmond Poillot, Sept. 25, Chartres (Savary).
(18). George Chavez, Sept. 27, Domodossola (*Bleriot).
(19). Ernst Plochmann, Sept. 29, Mulhausen (Aviatik-Farman).
(20). Heinrich Haas, Oct. 1, Metz (Wright).
(21). Capt. Macievich, St. Petersburg, Oct. 7 (Farman).
(22). Capt. Madiot, Oct. 23, Douai (Breguet).
(23). Lt. Mente, Oct. 25, Magdebourg (Wright).
(24). F. Blanchard, Oct. 26, Issy (*Bleriot).
(25). Lt. V. Saglietti, Oct. 27, Rome (Asteria).
(26). Ralph Johnstone, Nov. 17, Denver (Wright).

Chas. K. Hamilton and Dr. H. W. Walden, who are very much alive just now, are reported in the obituary column of an English journal.

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*Monoplanes.

It is of interest to note in connection with the "roll call" the fact that 84 people were killed last year in climbing the Alps, and this year the list totals 60 or more. It is not likely, it is pointed out, that there are many more Alpinists than there are volators. Every death in aviation is a disaster in the greatest degree, yet the public should not be too hasty in condemning the new sport.

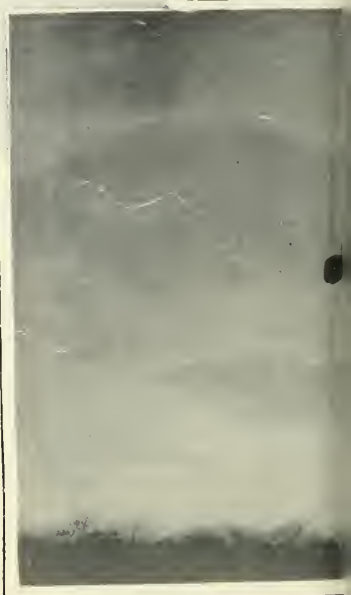
BALTIMORE MEET

(*Continued from page 208*)

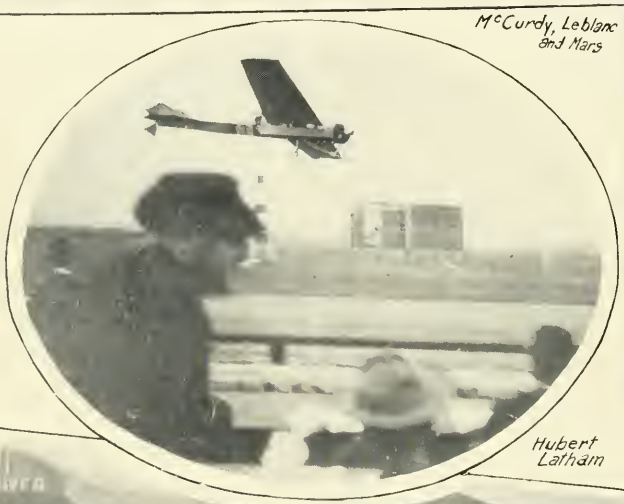
and the latter shot at a target with a rifle, and was unable to hit it out of something like a half dozen shots.

On the 11th, Hoxsey made a magnificent flight in a wind estimated at 30 miles an hour, but he could be seen working hard. The aeroplane acted like a rowboat in a rough sea—it was absolutely impossible for Hoxsey to hold it steady for more than a moment, and then great warping was necessary. Latham followed Hoxsey in the wind, and at one time it apeared as though he had lost control. He would drop 100 ft. like a flash, and then would be unable to regain the altitude without making a long incline. After two circles of the field, which took about seven minutes, he descended. The smaller and faster machines were helpless in such a wind as this, and did not attempt a flight.

The last day, November 12, Hoxsey was the only one who braved the icy gale. He was determined that no kind of weather would prevent him from flying at least once every day of the week. Late in the afternoon, when the greater part of the crowd had gone, Hoxsey's machine was wheeled out of the shed by a corps of helpers to prevent it being blown upside down before a start was made. The cheering which Hoxsey got after his flight clearly showed the appreciation of the public. That was the final flight of the meet.



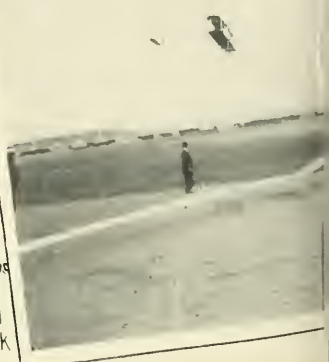
McCurdy, Leblanc and Mars



Hubert Latham

Ralph Johnstone

Starting the Demoiselle



Photos by Edwin Levick N.Y.

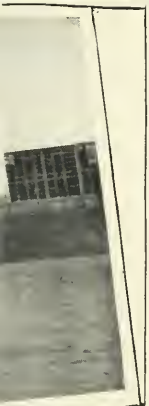
White and Harmon

Alfred Leblanc

John B. Moisant

C. Rudemans

C. G. White



Ogilvie

Latham Drexel Hoxsey Brookins

BALLOON RACE NEARLY BREAKS WORLD RECORD

Bennett Cup Stays in America

Hawley and Post Win Lahm Cup

ALAN R. HAWLEY

AUGUSTUS POST

THOUGH no official figures are yet available, it is practically certain that the winner of the fifth Gordon Bennett international balloon race, which started from St. Louis, Mo., October 17, has not broken the world distance record for spherical balloons, 1193 miles, made by Count de la Vaulx and Saint Victor, October 9-11, 1900, starting from Vincennes, France, and landing at Korostychew, Russia, though until this time it has been held that the la Vaulx record was broken by Messrs. Hawley and Post in their great trip. The distance from St. Louis to the point of landing of the America II. is 1,171.13 miles, as measured by Mr. Williams Welch, chief draughtsman in the office of the Chief Signal Officer, Washington.

After being lost to the world for a week the welcome news was received that Alan R. Hawley and Augustus Post were alive and well, after suffering many hardships in getting out of the wilds of a sparsely settled district.

Five Days in the Wilderness.

After a rough landing at 3:45 P. M. on Wednesday, the 19th, the third day after leaving St. Louis, Hawley and Post began their strenuous hunt for civilization. The night was spent in the basket of the balloon under a tarpaulin. In the morning a reconnoiter was made from a hilltop after a breakfast of soup and crackers. Soon the balloon was abandoned and the long hike begun with but a small equipment of edibles. After a wearisome and slow day, following a stream, another camp was made. Here some instruments were discarded and another day's jaunt begun. This was Friday morning. All day they followed the stream, which joined a river, covering but five miles the whole day. Another camp. By Saturday noon Hawley's knee gave out, having stepped into a hole a couple of days before, and a rest was taken until Sunday morning. By noon they found a woodsman's tent, with the proprietor absent. It was decided to stay here until he returned.

Another night, a really enjoyable one, considering the comforts of a fire and shelter, was spent here. Monday morning as Hawley stepped from the tent and in reply to his call, uttered in the hope that someone would hear, two trappers answered from a canoe. By 11 o'clock the four started down the river in the canoe and made camp after

This might be of interest to you

November 30, 1910.

Mr. Charles H. Weitman,

Aero Club of America,

New York City.

Dear Sir:

I am returning to you, under separate cover, the data you furnished me in regard to the landing places of the ten balloons in the International Race.

I computed the distance of the America II by spherical trigonometry, using a sphere whose surface equals the surface of the earth, as determined by Clarke in 1866, and I found the distance to be 1171.17 miles.

I asked the Chief Computer of the U. S. Hydrographic Office to verify my work and he made the distance 1170.25 miles.

The U. S. Coast and Geodetic Survey was requested to compute it, and ~~they~~ found it to be 1172.9 miles.

These differences are due to the fact that the earth is not exactly a sphere but swells out at the equator and the Coast Survey took into consideration the actual shape of the earth as determined from the most recent data, and their work of course is nearer correct than the others, and they believe it is within one-half mile of the true distance between the two points.

Yours very truly,

W. Welch

C. & A.

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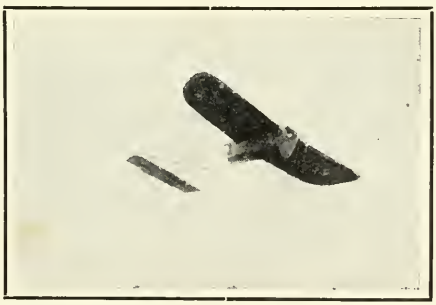

As was to be expected the monoplane aviators were the star performers at Belmont Park. The monoplanes won all the prizes for speed, endurance and cross-country flying. The leading monoplane at this meet, and the one which captured most of the prizes, was the Bleriot. Several of these bird-like machines flitted around the course at a fifty-mile clip for hours at a stretch, or made cross-country flights of from 20 to 40 miles without the least hesitation. Only when very strong winds prevailed were the Bleriots kept in their hangars; and even then they could have flown without the slightest difficulty had they been fitted with the **powerful gyroscope** used on

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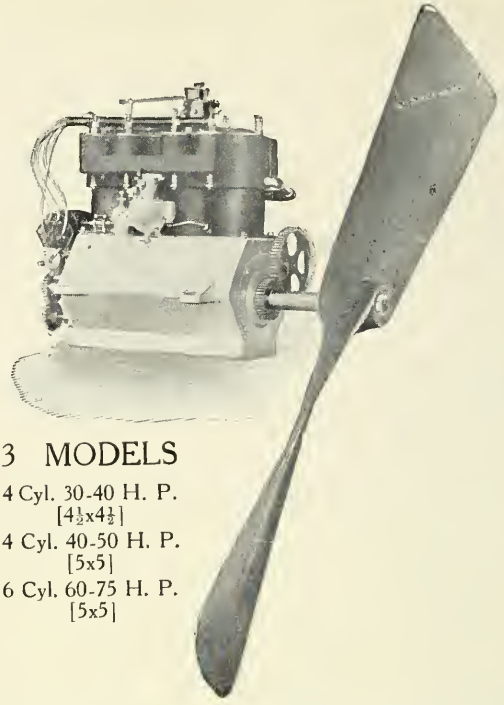

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(WRITE PLAINLY)

Standing of the Competitors.

Following is a schedule of the finish of the race, with approximate mileage given for all but the first:

1. AMERICA II., Allan R. Hawley and Augustus Post, landing northeast of Lake St. John, Que., 48 hrs., 50 min., 1,171.1 miles; but 22 miles behind the world distance record.

2. DUSSELDORF II., Ing. Hans Gericke and Samuel F. Perkins, landing 17 miles northeast Lake Kiskisink, Que., 42 hrs. 20 min., 1127 miles.

3. GERMANIA, Capt. Hugo von Abercron and August Blanckert, landing 4 miles from Coocoocache Sta., Que., 39 hrs. 7 mins., 1070 miles.

4. HELVETIA, Col. Theodore Schaeck and Paul Armbruster, landing 6 miles from Lorrainville, Que., 36 hrs. 28 mins., 826 miles.

5. HARBURG III., Lieut. L. Vogt and Wm. F. Assmann, landing 10 miles northeast North Bay, Ont., on Gull Island in Lake Nipissing, 32 hrs. 16 mins., 760 miles.

6. AZUREA, Lieut. E. Messner and M. Givaudan, landing 22 miles northeast of Biscotasing, Ludburry Co., Algoma, Ont., 38 hrs. 53 mins., 756 miles.

7. ISLE DE FRANCE, Alfred Leblanc and Walter de Mumm, landing 3 miles north of Pogamasing, Ont., Munro Siding, P. O., 35 hrs. 722 miles.

8. ST. LOUIS IV., H. E. Honeywell and J. W. Tolland, landing 1½ miles south of Hillman, Mich., 17 hrs. 35 mins., 552 miles.

9. CONDOR, Jacques Faure and Ernest G. Schmolck, landing 4 miles north Two Rivers, Wis., 20 hrs. 5 mins., 413 miles.

10. MILLION POPULATION CLUB, S. L. von. Phul and Jos. O'Reilly, landing 6½ miles north of Racine, Wis., 14 hrs. 38 mins., 361 miles.

covering 10 miles and encountering many lakes and portages. Trout caught from the stream furnished the next morning's meal. On Tuesday the trappers put the aeronauts ashore and, following a wagon road, a little settlement was reached. Here telegrams were sent and the anxiety of the interested world relieved. From there on it was easier traveling. When they arrived in New York they got a great ovation.

The greatest altitude reached was 17,000 feet. Bags of ballast taken, 29½; 6 left before landing.

The third day after the race started the ninth balloon was reported, that containing Hans Gericke and Samuel Perkins, who also had apparently nearly broken the world's record for distance. All the other balloons were reported without much delay. No balloon race ever held, so far as known, resulted in such generally great distances. The gas furnished was better than in 1907.

The American team originally included J. H. Wade, Jr., pilot and A. H. Morgan, aide. Owing to the death of a member of Mr. Wade's family it was impossible for him to go in the race and the president of the Aero Club of America authorized Mr. Morgan to act as pilot, with A. Leo Stevens aide. The St. Louis club members objected to this and demanded that S. Louis Von Phul, who stood fourth in the elimination race, be substituted. A rule was found to cover this point, and after a heated conference Bishop reversed himself and Von Phul was named as the third pilot of the team. H. E. Honeywell and J. W. Tolland comprised the third member of the American team.

TRIP OF THE DUSSELDORF.

By Samuel F. Perkins.

After 42 hrs. and 24 min. in the air, during which I saw some of the most wonderful sights of my life, we were dropped from a height of 4 miles in a very few minutes, into an almost impenetrable Canadian forest. These experiences, with the attending adventure in getting clear of the woods, form one of the most thrilling experiences I have ever known.

It was entirely by chance that I got the opportunity to go; Lieut. Gericke first offered the place to H. H. Clayton, who sailed in the winning balloon in 1907. Mr. Clayton could not accept, however, and the honor fell to me.

To me also fell much of the work of preparation for the trip. In case of landing on water, I took along two life preservers, and I took besides food and water for two, calculated to last three or four days. When we met at the balloon grounds, it turned out that Lieut. Gericke had understood that he was to attend to the food supply. So we had double rations, and rather than leave the food we put it all into the basket of the balloon. I was afterwards very glad that it happened so, for there is no doubt in my mind that it saved our lives.

At last came the starting signal, the men let go, ballast thrown out, the balloon rose, and we were off.

Lieut. Gericke and I had our plan of action all mapped out before we started. This was his first balloon trip in this country, but I was familiar with the country, having traveled all over North America from Canada to Mexico. I had also had experience with ballooning for some years under Capt. Thomas S. Baldwin. It was therefore arranged that I was to take charge of the maps and direct the course to be followed, and Lieut. Gericke was to operate the balloon. This plan worked out excellently; Lieut. Gericke is a master at handling a balloon, and as much of the success of the trip is due to his handling as to my finding the air currents we wanted.

Nothing eventful happened from the time of starting, Monday night, until 9:30 P. M., Tuesday. We had passed over Milwaukee and crossed Lake Michigan in the morning. At 5 o'clock we were becalmed over Georgian bay.

We began hunting air currents, making five trips from the level of the lake to a height of three miles in search of a breeze. Finally, about 9:30 P. M., we began to move to the northeast again, riding—as we afterwards discovered—on the front edge of a storm. The speed was terrific, and we whirled along all that night and all the next morning across rough country. It was all marsh land and looked as though, if we were to land, any walking would have put us into sloughs where we should have sunk and left nothing but a gurgle. The situation began to be uncomfortable; our ballast was running low, and when that was gone of course we should no longer have any control of the balloon.

We had seen no single sign of life since 9 P. M. on Tuesday, and here it was noon of Wednesday and we were tearing across impossible country at express speed. The last sound we had heard from below was when we passed over Grand Manitoulin Island in Georgian bay.

At night we often seemed to be chasing our own shadow, sometimes almost catching up with it, again falling far behind; this was caused, of course, by the contours of the ground beneath us. The oddest incident was to see cattle at night, scared by the hovering shadow, race madly away in fright, sometimes running for miles with their bells jangling.

Wednesday, just before noon, we saw a large lake about five miles ahead, and almost at the same time saw the rails of the Canadian transcontinental road for which I had been looking. It must be remembered that we had by now only the vaguest idea where we were, except, in a general way, that we were in the St. Lawrence valley and headed for the ocean or the Labrador coast.

We still had some ballast, sufficient to go on for some hours more at least. But here we were at apparently our last chance to get back to civilization. I knew there were no more railroads, and that in the direction in which we were traveling there was nothing but wilderness. We had some provisions, it is true, and I had a 22-calibre revolver; but we had no hatchet, no cooking utensils, in a word, no outfit for traveling through the woods. It seemed necessary to descend and land, and the big lake—it was Lake Kiskisink—looked to be the most favorable spot.

When the decision was made we were about three miles up. We tried to open the valve in the top of the balloon, but it would not work. The balloon went up fast, and we tried five times before we got it open. And then came a downward rush that is indescribable—4 miles downward in 9 min. As the gas leaked out the bottom of the bag caught the air, and the great canvas blew up into a mushroom against the overhead netting, making a parachute exactly like that used by the droppers from hot air balloons at country fairs

Of course the balloon was still traveling across country at a terrific rate, and when it seemed as

though we should be dashed against the treetops, I climbed out of the basket and up on to the side of the balloon, hanging in the netting, to ease the shock of landing.

Some idea of the speed at which we were going may be had from the fact—which we learned afterward—that though we started to come down when we sighted the lake 5 miles ahead, we got 17 miles beyond it before we struck the ground. The landing was very rough, and we were lucky to get off with our lives. The underbrush was very thick, and this undoubtedly saved our lives in the shock of landing, though that same underbrush later on nearly cost us our lives, trying to get through it.

It seemed to me that we were only a few miles beyond the lake, and that we could reach the railroad in 5 to 7 hours. So after a rest we started, first carefully packing the balloon. Also I climbed to the top of the nearest high hill, and set our flag on a tree; this also later on turned out to be almost providential.

It was 2:30 when we started on foot for the lake, carrying blankets and provisions and a few personal effects. All the afternoon and well into the darkness—until 7 P. M., in fact—we struggled through the brush. It seemed as though we had gone miles, but as a matter of fact it was not more than three-quarters of a mile. In the darkness we could not go ahead, or back, so we camped for the night. It began to rain—the very storm which had been hurrying us across country.

Next morning at daylight—this was Thursday—we returned to the balloon, realizing now for the first time that we had a serious job on our hands to get back out of the woods alive. We rearranged our packs, and started, this time in earnest. It seems ridiculous to say so, but the brush was so dense that we could make not more than a mile a day through it, and we had three small rivers and two lakes to cross, too.

The trip made me doubt many times whether the honor was worth the risk.

We crossed the lakes and rivers on rafts, which we made of logs tied together hurriedly. Making these rafts took time, for we often had to carry our logs for some distance, being unable of course to cut any near at hand.

At night we built huge bonfires on the top of an eminence. One man watched while the other slept, and the fire had to be replenished—with no ax to cut fuel, remember—every two hours. We heard wild beasts all about us, and thought we could distinguish the howling of wolves, but nothing attacked our camp. We saw on Friday the tracks of some large animal, probably a bear.

Every night we could hear the whistle of the train, but we never seemed to get any nearer to the railroad. This puzzled me greatly.

All day Thursday and all day Friday we plugged along, always expecting to come to the railroad and never reaching it. Saturday, at noon, we were making a raft, when we heard a gunshot. I immediately climbed to the top of the nearest high tree, fired my revolver, shouted and waved a flag. The man who had fired the first shot saw the flag, though he was nearly four miles away, and he came to us in his canoe.

He was Theodore Boivin, the guardian or watchman for the Pennsylvania fish and game club, on whose preserve we had landed. Boivin was making a trip up the river, looking for poachers, as part of his work, when he saw the flag I had stuck up on top of the hill where we landed. He was utterly at a loss to understand the flag, for nobody had left the lake for the woods, and there was no other way of getting into the woods. So he fired his gun, and heard our answer. From Thursday morning to Saturday noon, plugging as hard as we could, we had gone only 4 miles!

We learned from Boivin where we were, and were able to figure at once that we had come 1,240 miles. The lake was 135 miles northeast from Quebec.

Experienced woodsmen later told us we were extremely lucky to get out of the woods. Winter comes early in that latitude, and brings 10 ft. or so of snow when it does come. Sleeping out on the ground, too, for men unaccustomed to it, is very weakening. We were about all in when Boivin found us.

When we told Boivin that we had abandoned our balloon, he didn't know what we meant. He had never heard of a balloon, and had never been out of the Canadian forests in all his life. He thought we were foolish.

He took us down to the settlement in his canoe. There the people thought we had fallen out of the sky; that was as far as their imagination would take them. They told us that it would have taken us 12 days to get out, the way we were going, and that would have been only if we could keep up our speed.

We promptly went to bed at the village, and we stayed there 24 hours. I never was so glad to see people again in all my life. And then, after resting up, I started for home, by the way of Montreal. Mr. Gericke remained behind to get Indians to go with him and tote the balloon out of the woods.

By Capt. H. E. Honeywell.

After a perfect start from St. Louis in the international race, we took a northwestern course, being well equipped for a record run. We had 31 bags of ballast, which should have been enough to run us at least for 48 hours. Our instrument equipment consisted of two aneroids, two statoscopes, two recording barometers and a compass. Dr. L. E. Custer, of Dayton, furnished us with one of his statoscopes, an invention of his own and fully described in **Aeronautics** some time ago. Paul McCullough, of St. Louis, furnished us with a tungsten light and batteries, which gave constant illumination.

Up to 11 o'clock we had used 5 bags of ballast, running at an altitude of 400 to 800 ft. From then until 8 A. M. not an ounce was used. The good balloon took care of itself most remarkably, just skimming the earth.

My aide retired at 9 P. M., rolled up in a blanket on the floor of the basket. At 2 A. M. we passed over Davenport, Ia., with 26 bags of ballast. Here we started to go northeast. At 7:45 A. M. Lake Michigan was in sight and we were at an altitude of 4,000 ft., the sun expanding the gas. In 15 minutes we were just over the lake, with 24 bags of ballast, and 30 miles beyond Milwaukee. At 11:30 A. M. we were over Frankfort, Mich., on the east shore of the lake, altitude 6,500 ft., ballast 20 bags. At 3 P. M. we were at 5,000 ft. and going E. N. E., 10 bags of ballast, and using plenty of sand, as there were many choppy wind currents "Afraid we won't make over Lake Huron. Headed for Alpena. Our course over lake will be at least 185 miles. Contraction taking place fast," our records read. At 5 P. M. we landed just south of Hillman, Mich., with 5 bags left.

I have learned the cause why we could not strike an equilibrium over the lake and state of Michigan. The "Million Club" and the "St. Louis IV." balloons were not covered with tarpaulins during the night prior to inflation, as all the others were. The crickets had eaten many small holes, which had been covered with adhesive plaster during inflation. They became wet with dew the first night in the air and warped off the next day under the heat of the sun and the expansion. This caused a great leakage of gas and made it impossible for us to remain a second night in the air.

ASCENSIONS.

PITTSFIELD, MASS., Oct. 9.—William Van Sleet, pilot, and Jay B. Benton, in the "Pittsfield," landed at Fitzwilliam, N. H., at 6:45 A. M. to-day, after a 60-mile trip from Pittsfield, Mass. The ascent was made at 1:45 and the aeronauts encountered heavy clouds most of the journey. The highest elevation reached was 4,700 ft.

HAMILTON, O., Oct. 28.—Dr. L. E. Custer, pilot, and Dr. D. E. Sheehan, in the "Luzerne," up half an hour, landed near the city.

HAMILTON, O., Oct. 28.—Albert Holz, pilot, Jack Gordon, M. E. Meth, Frank D. Moore and Chas. Troutman, in the "Drifter."

NORTH ADAMS, Oct. 30.—N. H. Arnold, pilot, Leroy H. Taylor, W. A. Stowe, W. J. Seidenberg and Col. George W. Gregory in the "Cleveland," to Stafford Springs, Conn. Dist., 78 miles; dur., 4 hrs.

OAKLAND, CAL.—Capt. Park A. Van Tassel, pilot, landing near Alvarado, Alameda Co. Dist., 20 m.; dur., 2 hrs.

PITTSFIELD, MASS., Nov. 3.—Jacques Faure and Walter De Mumm in the "Pittsfield" in the rain. Landing 20 m. away, near Barrington.

NORTH ADAMS, Nov. 19.—A. Leo Stevens, pilot; H. Percy Shearman, Kenneth Price and George Ernst, all members of the Williams College Aero Club, in the "Cleveland," had a rough time of it. A high wind blew at the start and to avoid landing in a lake outside of Providence, R. I., it was necessary to throw out every available object, including clothing. This enabled the balloon to cross the lake, when Shearman was thrown out and somewhat injured.

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THREE STATES AERO SHOW

By Wilbur R. Kimball.

THE Three-States Aero Show, under the management of Henry M. Neely, opened at Philadelphia, November 2 to 12, inclusive, in the First Regiment Armory. The space was well taken up before the doors were open, and a fair attendance in spite of three days' bad weather. Exhibitors included a comprehensive showing of kites and aerial advertising apparatus by S. F. Perkins of Boston, the Metz Co. of Waltham, Mass., with a line of automobiles, a cross-channel type Bleriot, and their new rotary engine of 125 h. p. weighing 375 lbs.

The Detroit Aeroplane Co. had on exhibition a new type monoplane and their double opposed air cooled engine.

The Aerial Navigation Co. of America exhibited the Call aviation engine. Other engines shown were the Elbridge, Anzani and International Six Cycle. Other exhibitors were the Hart-Kraft Motor Co., Harris-Gassner Co., propellers; Mineola Novelty Co., the Gill biplane; the Burgess Co. & Curtiss, of Marblehead, Mass., with a new "Type I" biplane; Pennsylvania Rubber Co.; Wittemann Bros.; Lincoln Square Novelty Co.; Standard Roller Bearings, and Goodyear Tire & Rubber Co.

A prominent booth was occupied by **Aeronautics.**

Attendants were entertained with good music and moving pictures of the aeroplane flight by Col. Roosevelt, and the international balloon race at St. Louis arranged by L. E. Dare.

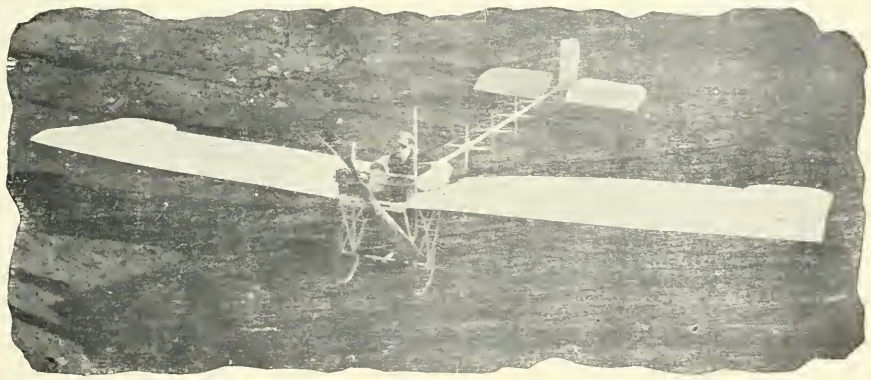
Two interesting features by Clifford B. Harmon were a new type of monoplane with two Gnome engines and his Farman biplane wrecked at Belmont Park meet.

this was one of the most popular features of the show. Harmon and Grahame-White came to the show one night and each ordered a set of Farman wheels from Goodyear. Harmon bought a set for the Cage Tubular Monoplane from the Pennsylvania Rubber Co., and a set of beautifully made scale drawings from Philip McCutcheon, a boy in the Pennsylvania Aero Club. Mr. Neely has purchased from him a set of working models for his lectures.

"Miss Detroit" Monoplane.

The Detroit Aeroplane Co. has put on the market a monoplane fitted with the company's two-cylinder opposed 20-30 h. p. motor. This was seen for the first time at the Philadelphia show. It is sold subject to half hour demonstration at the factory in Detroit. Details follow:

Main Plane.—Spread 30 ft., area 150 sq. ft. Ribs have a double curve. Waterproof fabric both sides. **Stability.**—In the extremities of the wings sections have been cut out and hinged to the rear lateral beam. These float in the air stream in flight, being depressed individually through their attachment to the steering column. The **fuselage** is a single seamless steel tube of large diameter braced with wires over horizontal and vertical masts. **Supplementary Surfaces.**—Two curved horizontal rudders are connected to the rear of the fuselage on a common axis. A vertical rudder steers right and left. **Running Gear.**—The framing of the engine section is of spruce joined with steel and aluminum connections. Twelve uprights run down



"Miss Detroit" Monoplane

Numerous small stalls were occupied by various models, while overhead were hung kites and gliders. The centre of the big hall was taken by the balloon exhibit of the veteran aeronaut, Samuel A. King.

Hugh L. Willoughby loaned his big biplane "War Hawk." There were four gliders exhibited. The White Aeroplane Co. had a good display of parts for models and accessories. The National Supply Co. was another exhibitor.

The Detroit Aeroplane Co. monoplane "Miss Detroit" was the hit of the show. Two of them were sold, one for Atlantic City, where a training school is to be started next summer. The Gill biplane and the Demoiselle were both sold. The "War Hawk" went at auction—the first aeroplane auction—to a man who wanted the engine, leaving the framework for Mr. Neely. Fourteen motors are said to have been sold at the show, mostly by the Detroit Aeroplane Co. The Goodyear Tire & Rubber Co. sold 830 yds. of fabric for two balloons which Samuel A. King will build for local enthusiasts. The Standard Roller Bearing Co. sold 2,000 sets of bearings in one order and the Harris-Gassner Co. sold 10 propellers. This concern had a man carving propellers right in their booth and

to four points at the axle of steel tubing. The two front wheels are quite large. A rear wheel is just below the vertical rudder pivot. This wheel steers on the ground. **Power Plant.**—Detroit Aero engine, 20-30 h. p., 2 cyl. opposed, driving 6 ft. propeller, of 5 ft. pitch. This air cooled engine is claimed to deliver 25 h. p. at 1,200 r. p. m. Four pedals operate spark advance and throttle. In the rear of the engine is an oak seat. **Control.**—Directly in front of the operator is a universally mounted hand wheel. The elevating planes are controlled by a fore and aft movement of the steering column, lateral stability by movements to right or left. The vertical rudder is controlled by turning the wheel around its axis. The foot operates a brake. The weight is 250 lbs.

Call Engine.

A rather unusual exhibit was that of the Call aviation engine, exhibited by the Aerial Navigation Company of America, with headquarters at Wichita, Kansas.

All the exposed parts, from cylinders and cylinder heads down to the minutest details not constructed of magnalium, a shining, non-corrodible metal, are

nickel plated, and the whole polished to a mirror finish.

Indeed, as the eye takes in a mechanism of this character, suited in appearance to adorn the show window of any jeweler's shop, the conclusion is at once reached that the exhibition structures are specially prepared for the occasion. We were assured, however, that the engines shown are regular stock engines.

It is, moreover, evident that strength and reliability have not been sacrificed to mere beauty of appearance. On the contrary, the care in this particular is only indicative of the workmanship throughout, as shown by the unassembled parts, also on exhibition.

The cylinders are of vanadium grey iron, with walls five-sixteenths of an inch in thickness throughout, and in addition are heavily ribbed with spiral water-jacket partitions, and strongly filleted at corners. The cap screws at cylinder base and head are three-eighths of an inch in diameter, and instead of the usual four, or at most six, in number, one dozen are used to secure each cylinder to crank case, and one dozen to secure each cylinder head to the cylinder.

The same regard for strength manifest in the cylinder construction is also shown in the cylinder heads and piston heads. Like the cylinders, these are of vanadium grey iron, cast in the company's foundry, the pistons being about five-sixteenths of an inch in thickness at the head and around the circumference to a point below the wrist pin bearings. In addition star-type cooling and strengthening flanges radiate from inside center of piston head and along the walls beyond the piston rings and wrist pin bearings.

The cylinder heads are also approximately five-sixteenths of an inch in thickness adjacent to explosion chamber, with nine-sixteenths of an inch water jacket space. Both the exhaust and intake valves are in the head, the cages being of vanadium grey iron cast integral with the cylinder heads, thus insuring against danger of leakage, and possessing the additional advantage that valve seats are adjacent to water jacket without intervening joints.

The crank shaft is 1 37-64 in. in diameter, and 1¾ in. at the crank pin bearings, while the throws are 1 in. x 2 in. This, together with the cam shaft, valve stems, push rods, and other like parts, is of vanadium steel twice heat-treated in the company's plant to 1,550 deg., quenched in oil, and thoroughly annealed. Lathe shavings are shown of such uniform strength and toughness that they require the full exertion of a man's strength in a direct pull to break.

The crank case is of magnalium, a light and very strong alloy of magnesium and aluminum, thoroughly ribbed and braced in such a way as to enable it to withstand any explosive stress encountered.

In addition to large valves with unusual valve lift, an auxiliary exhaust one inch in diameter gives ample clearance of exhaust gases, thus protecting valve seats and valve stem bearings. The auxiliary exhaust is provided with check valve to avoid escape in the compression, as also the inrush of unmixed air or exhaust gases during suction stroke. Both main and auxiliary exhausts are silenced.

Force lubrication is provided from a tank by means of a gear pump, distributing oil to various needle valve sight feed oilers, a relief valve between the pump and feeds permitting the surplus supply of oil to return to tank. A similar pump and circulating system for gasoline permits the direct injection of fuel into cylinders, as in the celebrated Antoinette engines—should this system be preferred to a carburetor—with the additional advantage that in the Call engine the fuel is injected into specially constructed mixers, and from there drawn into the cylinders. A much larger gear pump provides force water circulation, and is especially adapted to circulate the water through the spiral water jackets and throughout the length of the "Call Combination Radiator and Heater."

The engines exhibited are of the opposed type in 2 and 4 cylinders; the 2 cylinder engine develops 50 h. p. and the 4-cylinder, 100 h. p. at 1,750 revolutions, A. L. A. M. rating. This comparatively high power development is permitted by the unusual size of the cylinders, the bore being 6 inches and the stroke 5¾ in. The manufacturers, indeed, claim that the use of this size cylinders, as also the opposed construction, enables them to construct a remarkably strong, while at the same time an unusually light engine. Although the weight is but little over 3½ lbs. to the h. p., the crank shaft, connecting rods, cylinders, and other parts approximate in size and weight the very strongest automobile engine construction.

During the Philadelphia Aero Show Carl Wittemann, Philip McCutcheon and W. H. Aitken made short glides in a Wittemann glider, towed in the air by willing hands at ropes tied to the machine.

EXHIBITS AT BELMONT

Under the grand stand there was held during the meet an exhibition of aeronautical supplies, though not very complete. The Aerial Equipment Co. showed the Anzani motor, and C. H. Metz, of Waltham, Mass., a new revolving engine, of 125 h. p., for a weight of 375 lbs. There are seven cylinders, 6¾ bore and stroke. These are machined from chrome steel, as well as the crank shaft and pin. The valves and push rods are nickel steel. The gas is taken in through the crank shaft to the base and intake pipes to mechanical valves. Oiling is by geared pump through crank shaft, and distributed to pistons and bearings by centrifugal force. This company also exhibited an Anzani-engined Bleriot, and will shortly have on the market "Bleriot-type" monoplanes.

The Hartford Rubber Co. have brought out a new tire, 20 x 3, which looks fine. The Goodyear Tire & Rubber Co. had a fine exhibit of tires and various weights and kinds of aeroplane cloth which they have recently put on the market. The American Propeller Co. was represented with a big stock of Paragon propellers, and reported good business.

The White Aeroplane Co. had a large booth. The White catalogue is the first we have known to be devoted to model work. Gas engines are listed from $35 to $105, and even ball bearing propeller shafts and driving gears and brass fittings may be had. There are miniature turnbuckles, wheels, propellers, forks, rattan and bamboo listed, everything a model maker might want.

The two cylinder opposed Call engine, of the Aerial Navigation Co., of Girard, Kansas, with its highly finished cylinders, attracted considerable attention. This was the first time it was shown in the East. Other exhibitors were: John A. Roebling's Sons, wire cable; Peter Frasse & Co., tubing; Bosch Magneto Co.; Marburg Bros., Mea magnetos; Emerson Engine Co.; Y. M. C. A. aero school.

The Emerson 100-125 H. P. 2-cycle engine shown under the Belmont grand stand was one beautiful piece of workmanship. One feature in the building of this motor, which is not in use elsewhere, is the method of turning the piston heads. During this operation each one is heated to 700 deg., or service temperature. Instead of being turned absolutely round when cold, and then be out of shape when hot, they are turned hot, so that when heated in service they come up to perfection in fit.

The Emerson engine is the highest powered 2-cycle aero engine on the market, rated at 100-125 h. p. for 300 lbs. of weight. It holds a world record in the 26-foot motor boat class, of 36.1 miles an hour. A feature is the heating of the gas mixture before it enters the combustion chamber.

Marburg Brothers, of 1777 Broadway, New York, had three articles which should be of considerable interest to everybody interested in flying machines.

First among them is the Mea high tension magneto. The main difference between the Mea and the type of magnetos which we have been accustomed to is the adoption of a bell-shaped magnet. The same is placed in a horizontal plane, and the armature runs in the axis of the magnet. As a consequence the whole instrument is practically centrifugal with very little overhanging weight, and in advancing and retarding the spark the field magnet is advanced and retarded together with the timer, thereby assuring a spark of equal heat over a practically unlimited range of timing. We are told that instruments have already been delivered for aeroplane work with 100 deg. range of timing, something that must be of the greatest interest to manufacturers of 2 cycle and also 6 and 8 cylinder engines.

The S. R. C. ball bearing is another article exhibited by Marburg Brothers. This bearing is made in Switzerland, and the shape of the cage is quite different from that of other bearings. It works like a scoop, thereby forcing a very liberal circulation of oil.

The third product exhibited by Marburg Brothers is "Duralumin," a metal which, according to tests made, is as light as aluminum and as strong as steel. It can be rolled in various shapes, and can also be drawn in tubes.

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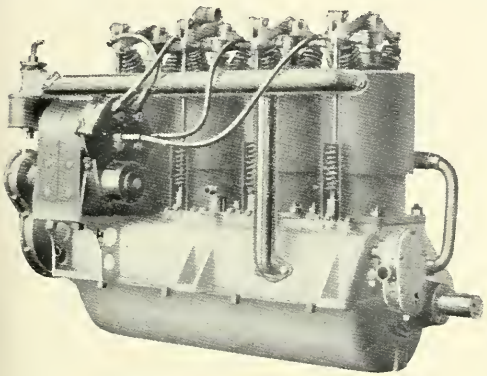

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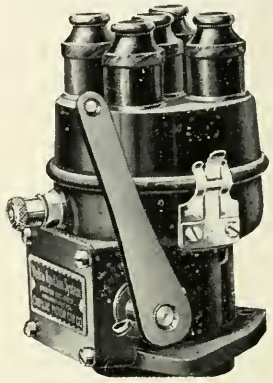

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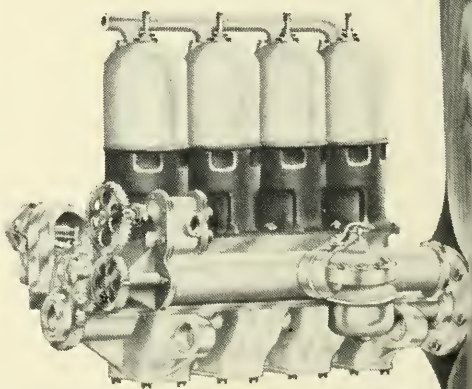

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ST. LOUIS SHOW

By E. Percy Noel.

THE main features of the show are the full-sized aeroplanes, which are exhibited in the center of the Coliseum. Many types are represented, among them Captain Baldwin's new machine with wing tips. The St. Louis "Post-Dispatch" has his old biplane, the Red Devil, on exhibition. The latter is the machine with which he flew 40 miles along the St. Louis river front late in September.

The Detroit Aeroplane Company introduces the monoplane "Miss Detroit," which was one of the centers of interest at the Philadelphia Show.

The Aeromotion Company of America exhibits a Farman-type biplane and also a 50 h. p. Gnome motor. Howard W. Gill has one of his noiseless biplanes on exhibition in the center space. E. F. Waits, a local builder, has a Demoiselle-type monoplane to show. The Aeronautic Supply Company exhibits a Gill biplane of the Curtiss type.

L. L. Prince has his monoplane of the Bleriot type completed and it occupies a prominent place. Other machines are those of A. Kuhno and E. Swift, the former being similar to the Gill biplane, and the latter a new development of the ornithopter idea.

Model monoplanes are shown by Sam Lambert (Bleriot), Jean H. Reitmann (two models), W. R. Williamson, W. L. Newson (Cage monoplane), Paul Barney, large model of his own invention, and L. E. Dare, who exhibits working models. A model triplane is shown by A. T. Harley.

The aeroplane supplies are shown by the Aeronautic Supply Co., which, by the way, was the first organization of its kind in America. The Mineola Specialty Co., too, has toy aeroplanes on sale. The Carter Carburetor Co. has a full line of its carburetters on exhibition. The White Aeroplane Co. has a line of miniature parts for inventors and model makers and complete models. J. Deltour & Co., of New York, show bamboo, cane and light woods galore, to cheer the builder's heart.

The Pennsylvania Rubber Co. has a display of its fabrics and aeroplane cloths. Penacloth, the new creation, promises to become one of the staple products of its kind and this within a very short time.

The Goodyear Tire and Rubber Co. shows an outfit of tires, rubber springs, shock absorbers and bumpers of the latest design. A varied assortment of samples of different grades of balloon and aeroplane cloth is to be one of the features of the exhibit.

The St. Louis Pattern and Model Co. has an interesting array of models and of patterns for parts, together with an original model aeroplane. It will also have an assortment of small nickel-plated aeroplane models, intended for the automobile owner as an ornament on the water cap of his radiator.

At the Leading Brass Foundry booth we find a large assortment of McAdamite castings. McAdamite is a new metal and is one of the lightest, and, considering its weight, one of the strongest, alloys yet compounded by man. It is made under a secret formula, at a Brooklyn plant, and the raw metal is shipped out to the agents to be made into castings.

Among the most interesting exhibits on the grand circle are those containing aeroplane motors. The Gnome, in particular, attracts much attention, because it is so little known in this section of the country. Next is the Boulevard, which is daily making a better reputation for itself. The Aerial Navigation Company of America exhibits its horizontal 2-cylinder motor.

There will be at least one Elbridge motor on the floor, owned by J. N. Sparling, of East St. Louis, Ill. Other engine exhibits are a 4-cylinder Curtiss, shown by Roy W. Anselm; a Lippert, a Roberts, a Hardy-Davidson and an Overland. The Detroit Aeroplane Co. is featuring its double-opposed air-cooled motor in addition to its aeroplane. An Anzani is promised before the end of the show.

The Phoenix Auto Supply Co., of St. Louis, has a Detroit "Aeromotor" on exhibition, in addition to a general line of automobiles and aeronautic supplies. Of interest to both automobilists and aeronauts should be the exhibit of dehydrated food by the American Food Co., which is a condensed article of diet useful to airmen.

The C. & A. Witteman Co., which has been making aeroplanes and gliders for several years, shows an interesting exhibit. The company did not decide to use the space at the show until almost the last moment. It has an exhibition of supplies and accessories. The company is one of the best known American concerns, and the exhibit should prove one of the most interesting in the Coliseum.

Samuel F. Perkins, with his man-carrying kites, with which he has made frequent ascensions, exhibits various kinds of cerf-volants. He furnishes man-carrying kites for exhibition purposes and also advertising kites, which attract a great deal of attention.

The Overland Automobile Co. showed its famous wind-wagon. Capt. John Berry, the veteran St. Louis aeronaut, is to exhibit the balloon basket with which he has long intended to climb Mt. McKinley.

Other exhibitors are the Signal Corps of the National Guard of Missouri, the United States Weather Bureau.

The following makes of propellers are found on exhibition: Chauviere (Aeromotion Company of America), Paragon (American Propeller Co.) and propellers made by the St. Louis Pattern Co., the Harris-Gassner Co. and the Aerial Navigation Company of America.

Ben Schwartz will exhibit a dirigible balloon and a small 1½ h. p. motor, designed to operate it. It is intended to be steered by wireless. Spherical balloons will be shown by the Aero Club of St. Louis, the Million Population Club, and Capt. John Berry.

The hangar and tent department are represented by the F. L. Stewart Construction Co., which builds aeroplane hangars; the O. K. Harry Steel Co., which furnishes portable hangars and which will have a small steel model of a hangar with a miniature aeroplane inside, besides a full-sized automobile garage; and the Missouri Tent and Awning Co., designers of aeroplane tents. The S. F. Bowser Tank and Storage Co. will show hangar equipments of buried gasoline tanks and self-measuring pumps.

Chicago Show Postponed.

The aeronautic show of the Aero Club of Illinois has been postponed from December 1 to 8 to March 6 to 13. It is believed the spring of the year is a better time to hold a show there, and the dates decided upon are much better than the ones formerly selected.

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"AERONAUTICS"
250 West 54th St., New York

News In General

Aero Show for New York.

The rapid growth of the aeronautic industry has now made it possible for the first time to bring together under one roof a great number of representative aeroplanes that have accomplished sensational results.

The first Industrial Aero Show will be held at Grand Central Palace, New York, December 31 to January 7, 1911, in conjunction with the eleventh International Automobile Show.

Some of the best known aviators and manufacturers have promised to be present and have their aeroplanes or accessories on exhibition.

Such a representative gathering of the leaders will afford an opportunity seldom offered for the display of all aeronautic apparatus, accessories and supplies.

Complete information regarding rates, allotments of space, etc., will be mailed upon request.

One entire floor will be reserved for the aeronautic display, well lighted and decorated in order to show off the exhibits to the best advantage. See advertisement in this issue.

As the aviation centre of the United States, New York is, with its manufacturing interests and aviation fields within easy reach, particularly adapted to the holding of such an exhibition, and an attendance of 150,000 at the Automobile Show of a year ago promises a still larger attendance this year.

The first comers will get the best space, and the shortness of the time makes immediate action necessary. Write **Aeronautics** for complete information.

"Missing Link in Aeronautics."

In the article with the above title published in the November number, it appears a typographical error was made. The author, in a communication, says:

"Errata: Page 155, line 5, par. 4; should read '49 hundred per cent.,' instead of '59.'

"Also: Par. 1, second col., page 155: Your editorial note takes exception to something I do not say. I say **almost** totally disregarded. Aeroplanes wouldn't fly at all if they entirely disregarded the rarefaction—since that is what produces levitation. Examine any detail photo of the usual plane and you will see there are hundreds of holes, loose lacings, etc., which allow the rarefaction to be interfered with by leaks from below. Vertical keels, instead of being joined to horizontal planes air tight, always leave a nice open space at the joint, which is decidedly coarse work.

Cordially,

JOHN D. PURSELL.

Aero Club Dinner.

More than three hundred real aviators, enthusiasts, experimentors, scientists and parlor aeronauts and aviators, attended the dinner given by the Aero Club of America and the Belmont tournament promoters to the aviators, even if some of the guests did attend an opposition dinner given by J. A. Drexel to his fellow birdmen. These, however, came in later with Grahame-White to see the presentation of the Gordon Bennett trophy. The dinner was held at the Plaza Hotel on October 31.

August Belmont, the president of the meet, and head of the Westchester Racing Association, which owns Belmont Park, made the preliminary remarks, apologizing for the meet's shortcomings by reason of lack of time in preparation and bad weather. Bishop then took the reins and presented the gold medal of the club to Messrs. Hawley & Post in honor of their winning the Gordon Bennett balloon race, and the making of a new world's record for distance. Alfred Leblanc, who lost the Gordon Bennett aviation race through his unfortunate accident, was presented with a loving cup in behalf of the meet committee. Bishop spoke in glowing terms of the brothers Wright, without mentioning their names, and complimented Johnstone on his wonderful new height record. Praise was showered upon Moisant, who won the Liberty prize. In response to repeated calls for a speech, Moisant told of his flight from Paris to London. This was but his fifth flight, and he had never been in England before. The story he told was of absorbing interest.

Pierre Gasnier spoke, followed by Gen. Nelson A. Miles. In succession were introduced Col. Schaeck, Capt. Von Abercron, Grahame-White and Jacques Faure. In replying Grahame-White paid his respects to Leblanc as his superior at the art of flying, and admitted with perfect frankness that he won "by the bad luck of Leblanc." He thought the new little Wright machine a marked improvement over the standard size flown at the Boston meeting. In closing his remarks he hoped to see good worthy American sportsmen next year in England, and "although we have very great hopes of retaining the trophy, we trust you will put up a very good sporting chance of returning it to this country." Latham spoke for a moment and complimented Johnstone on placing the American flag above all others.

After a short but eloquent speech by Walter Wellman, moving pictures were shown of the Wright aeroplane and the St. Louis balloon race, after which Hawley and Post each gave a short account of their experiences.

Clifford B. Harmon was presented with the Doubleday trophy for his flight across the Long Island Sound. Captain Thomas S. Baldwin was given a gold medal by St. Louis Aero Club men as an appreciation of his flights recently at that city, but this was not presented publicly.

But few of the aviators were present at this dinner as guests, as Drexel was giving a dinner at the same time at another hotel. Just after the speaking began, however, the insurgent aviators came in to see White presented with the cup. Some of the aviators state that they were not invited to the dinner, and therefore accepted Drexel's invitation. Neither the Wrights nor Curtiss were present at either dinner.

German Wright Patents Upheld.

In Germany a patent is worth something. One must go to court to prove a patent invalid, while in America the patentee must bring suit to find out if his patent is any good. In Germany a number of inventors formed a syndicate, and one of their number brought a suit to have the Wright patent declared of no value. The patent was upheld.

Appeal for Erecting a Memorial to the Honor of Otto Lilienthal.

Intense was the enthusiasm when Count Zeppelin's long and strenuous struggle for the conquest of the air was crowned with such unexpected success.

People's thoughts then turned to that hero who, as the first aviatiker, had realized the century-old wish of humanity to fly like a bird. The name of Otto Lilienthal was again in everyone's mouth!

By taking Lilienthal's life-work as its foundation, modern aviation has been able to acquire its great success! The first person to realize the great idea was also its first victim. Thus honor was denied to the discoverer during his lifetime, and this is now the time to pay off the debt of honor to this first hero of aviation by erecting a memorial for him.

May each one then contribute according to his means so that a worthy memorial may be erected to this pioneer of the clouds in Gross-Lichterfelde, where he lived and made his first attempts at flying.

From the contributions received it is also suggested that a confirmed invalid son of the inventor should be supported.

The Deutsche Bank and the Dresdener Bank, together with all their branches, say that they are willing to receive contributions for the "Lilienthal-Denkmal" fund. Kindly send postal orders to the "Arbeits-Ausschuss zur Errichtung eines Lilienthal-Denkmals," 45, Wilhelmstr., Berlin, W. 66.

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8 foot—400 to 500 lbs. thrust guaranteed at 1000 to 1100 R. P. M.

Cut this out for future reference; as it may not appear in next issue.

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can furnish you with Aeroplanes which are among the most successful **Domestic Made.** Come and witness for yourself demonstration flights which will be given—by appointment—of one hour duration, if you are skeptic. **Farman Biplane—Original $3500,** equipped with Elbridge Engine. Half the cost of an importation, with **Free Tuition to Purchasers,** immediate delivery,—also marketing small Biplane, and our own designed Monoplane.

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wishes to announce:- On account of the lateness of the season with its uncertain weather conditions, which may prevent daily operations, our rule which constitutes a full course taking up 4 to 6 consecutive weeks of Practice Flights have now been changed to **a full course constituting 20 flights** to the pupil accompanied by the instructor; and 5 flights thereafter by the pupil alone, in conjunction with technical training in the Art of Practical modern Aeroplane construction. Enroll now, your services will be in demand.

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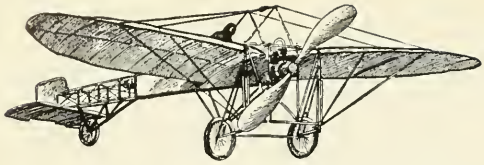

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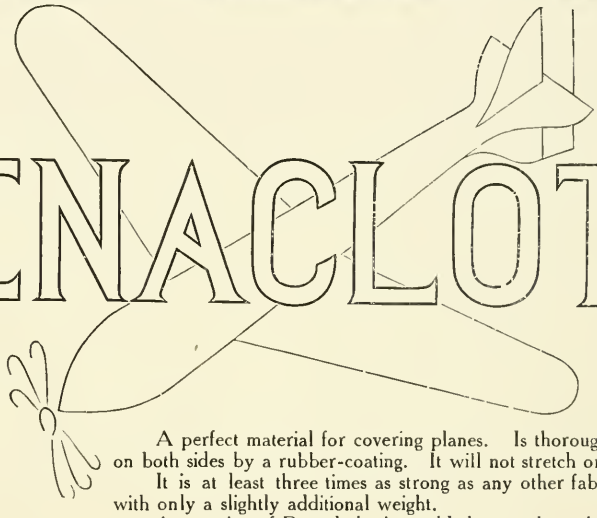

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Wellman Fails in Cross-Ocean Trip.

Walter Wellman, who left Atlantic City on October 15 in his dirigible "America" for a journey across the Atlantic, was rescued, with his crew, on October 18, by the steamer Trent, some 375 miles east of Norfolk, Va. One of the airship's engines was out of commission, and so much gas had been lost that the ship was dangerously near the ocean. When the Trent was sighted Wellman sent wireless distress signals, and after much manouvering, lowered the lifeboat with which the airship was equipped, pulling to the Trent. The ripping panel of the "America" was pulled and the airship was abandoned, Wellman stating that a larger and stronger one would be built, without an equilibrator, which proved to interfere with steering and transmitted the shock of the waves to the ship with a dangerous violence.

Thus one of the most remarkable flights yet made by an airship was brought to a close. That a tragedy did not accompany the climax is a matter of great good fortune, as the dirigible had been blown far away from the usual transatlantic steamer lanes and was almost outside the range of the coast steamers.

The distance the ship covered is more or less a matter of conjecture, but it is probably somewhere around 800 miles. After leaving Atlantic City, wireless reports followed the airship till it was off Nantucket, where the distance severed communication. The total time in the air was 71½ hours.

Aeroscribes Organize.

The National Aviation Writers' Association has been organized with the following officers: President, W. H. Leonard, Los Angeles, Cal.; district vice-presidents, John T. Custis, managing editor of the "Inquirer," Philadelphia; E. L. Jones, New York; Chester I. Campbell, Boston; E. Percy Noel, St. Louis; Victor Lougheed, Chicago; H. A. Somerville, Montreal; Paul Cowles, Atlanta; secretary, Arnold Kruckman, New York; western secretary, Cleve T. Shaffer, San Francisco; treasurer, George B. Harrison, Los Angeles.

The object of the association is distinctly stated "not to stimulate interest in aeronautics, make any profits or otherwise to interfere with the perquisites of aviators (joke!), but to provide accurate interchange of information regarding aviation and to advance knowledge of the correct terms concerning aeronautics and aviation." Local organizations to be known as "hangars" will be formed in all cities where newspaper men and others are interested in aviation.

Official headquarters have been established at the office of **Aeronautics,** 250 West 54th Street, New York, and at the club rooms of the Aero Club of California in Los Angeles.

Incorporations.

Smith-Matteson Mfg. Co., 6628 Delmar avenue, St. Louis, Mo.

The Thomas Aerial and Flying Machine Co., Evansville. Capital stock, $50,000. Object: To manufacture, buy and sell flying machines. Incorporators—H. B. Thomas, Charles F. Diessendorf, August Pelz.

Detroit and Cleveland Aerial Navigation Co. Capital, $25,000. The officers in the new company are identically the same as those in the Detroit and Cleveland Navigation Co.

Coyne Helicopter Airship Co., of Spokane. Capital, $2,000,000. M. E. Sullivan, Phil Dunne and W. E. Smith.

Cornelius Aeroplane Co., Fresno, Cal. Capital, $50,000. To exploit patents of C. H. Cornelius. Subscribers—Calvin Pearson, V. A. Wintemute, D. A. Cowan, C. H. Cornelius and James Warrington, all of this city.

The Boughton Flying Machine Co., Pierre, S. D. Capital, $1,000,000.

Christmas Aeroplane Co., Washington, D. C. Incorporated with $200,000 capital stock. William Christman, president, 725 12th street, N. W.; C. Calvert Hines, vice-president, Victor building; Robert Ions, secretary.

American Aeroplane Manufacturing and Exhibition Co., Philadelphia. Capital, $50,000.

General Aviation Co., Quincy Building, Denver, Colo. Capital stock, $150,000. President, E. H. Bjorkman; vice-presidents, Hamilton Armstrong, Alexander Stewart and Arthur C. Wagner; secretary, Irvin L. Richards; treasurer, Adolph Miller. The company has taken over the rights of the J. P. Erie aeroplane, which is reported to have made flights. Mr. Erie is the general superintendent.

Alden Sampson Mfg. Co., office at the Corporation Trust Co., 15 Exchange Pl., Jersey City. $2,500,000. Motors and flying machines. Incorporators: Kenneth K. McLaren, of Jersey City, agent of the Corporation Trust Company; Henry E. Tobey, of 120 Broadway, New York; James A. Dailey, of Ossining, N. Y.; Leon R. Jillison, of 202 West 74th St., New York, and William R. Watson, of 481 Sixth St., Brooklyn.

Aeroplane & Automatic Balancing Machine Co., of Mitchell, S. D., incorporated for the sum of $150,000. The officers of the company are: President, A. W. Gaines; vice-president and general manager, F. Irving Kiser; secretary, W. A. Heimberger; treasurer, W. T. McConnell; attorney, Chas. F. Tym; superintendent of construction, George M. Ellis. The directors include the above officers and in addition W. E. Turner and Dr. B. A. Bobb. To exploit machines designed by George M. Ellis.

The "Trent" approaching the airship. The life boat of the "America" has not yet been launched.

Book Review.

Hudson Maxim, president of the Aeronautical Society, has added another lasting contribution to science in his "Philosophy of Language and Science of Poetry." (Funk and Wagnall's, 1910.)

As his introduction well states, "The main object of the book is to provide a practical method for literary criticism and analysis and to provide an efficient and practical means for the standardization of poetry."

With the analytical mind of the scientific investigator Mr. Maxim has uncovered the underlying principles of sound and announced for the first time their operation in human speech. With premises that he makes self-evident, he hammers home conclusions that leave no room for refutation. He arrives at his definition of poetry—"the expression of insensuous thought in sensuous terms by artistic trope," after a masterful analysis of what is best in our language.

His book is a diet that high school and college students should be fed on, a work of art that no lover of literature can be without.—A. E. HORN.

L'Aviation de Demain, par Francois Ernoult, ingenieur, un volume in-8°.—Librairie Aeronautique, 32, Rue Madame, Paris.

Se basant sur l'observation, qui permet de constater que, comparativement a nos aeroplanes actuels, les oiseaux depensent extremement peu de travail pour voler, l'auteur s'est rendu compte que les organes de ces derniers sont constitues, de telle facon qu'ils recuperent la presque totalite de l'energie necessairement employee pour vaincre les diverses resistances.

M. Ernoult nous devoile dans son ouvrage le secret de cette recuperation en nous en exposant le principe, qui se trouve etre d'une simplicite vraiment remarquable.

L'application de ce principe a nos appareils d'aviation permettrait de realiser a la fois et automatiquement la recuperation du travail de penetration et de sustentation, le vol a voile et l'equilibre automatique.

Des horizons nouveaux nous sont decouverts et l'avenir pourrait bien nous menager avant peu des surprises.

The **Aero Club of America** held its annual meeting on November 14 and, as usual, elected the "regular" ticket, nominated by the board of directors. About 50 were present, of which, evidently, but 25 voted. It was expected that there would be some interesting proceedings, on account of the opposition ticket, but nothing very sensational occurred. After various reports and resolutions were read the result of the "vote" was announced. The regular ticket received an overwhelming majority, though solely by means of proxies. Practically everyone present who "voted" cast the opposition ballot amended in some form. There were said to be 205 proxies on hand, received after two urgent circulars were sent out to "members" by the club, out of club funds, so there was little chance for free expression of choice.

Gage E. Tarbell was present for a little while, but left, evidently in disgust. Clifford B. Harmon and many other prominent and active members were among those absent and whose proxies had not been sent in.

Talk of New Club.

There is much talk of forming a new body by the men in the Aero Club who are doing real work, though this scheme has not yet been put in any definite shape. There is another rumor afloat that it is not impossible that the club may lose its international affiliation.

The membership was announced as 392. Two years ago the number was but a hundred less, so little has been gained in membership. Many have joined, but many have resigned, among the latter being many well-known men.

There are three factions, at the least, now in the club. The old insurgent element which put up opposition tickets for two years, brought suits to set aside the election of a year ago, which was clearly shown to be illegal in the hearing of another faction, did nothing this year towards a ticket of their own, for some reason or other. And this faction has gained in strength. Then there is the old guard which stands by Bishop, with just a little new blood, and the entirely new element headed by Ryan, et al. More and more of the members are beginning to see what the Aero Club of America might be if properly handled. Life is beginning to be discovered among the membership, and the next year will undoubtedly see things done; whether in the right or wrong direction remains to be seen.

The Two Tickets.

Aero Club of America "members" duly received the usual yearly communication announcing the board of governors ticket for the ensuing year, together with a formal notice of the meeting and a blank proxy which members expecting to be absent might sign so that their votes could be counted for the official ticket.

Heading this ticket was Alan A. Ryan for president, J. C. McCoy, first vice-president; Dave H. Morris, second vice-president; James A. Blair, Jr., third vice-president. The members were notified to be ready to act upon recommendations for an increase in the number of governors from twelve to twenty, and the creation of a committee on foreign affairs.

The ticket for the board of governors included: Cortlandt Bishop, James A. Blair, Jr.; Chas. Jerome Edwards, Lyttleton Fox, Lawrence L. Gillespie, Alan R. Hawley, W. W. Miller, J. C. McCoy, Dave H. Morris, Maj. Samuel Reber, Alan A. Ryan and Samuel H. Valentine.

The following members of the old board did not find their names among the elect for the coming year: Philip T. Dodge, A. H. Forbes and Chas. A. Munn.

The additional governors in case the board be increased were named as follows: A. B. Lambert, of St. Louis; Dr. A. F. Zahm, of Washington; Prof. A. Lawrence Rotch, of Boston; Rodman Wanamaker, of Philadelphia; "Col." Jerome H. Joyce, of Baltimore; Russell A. Alger, of Detroit; Harold McCormick, of Chicago; and Prof. H. LaV. Twining, of Los Angeles, Calif.

It is at once apparent that the club desires to make itself stronger in national affairs, and a greater power in the "National Council of the Aero Club of America," which has not been heard of since its tumultuous creation, and which, Dame Rumor has it, will before long have an "s" after the word "club."

On the night of the Aero Club dinner, October 31, an opposition ticket appeared in the field, with Cortlandt Bishop for president, Clifford B. Harmon for first vice-president, J. Parke Channing second vice-president, and Peter Cooper Hewitt for third vice-president, with some changes in the board of governors list. The sponsors for this ticket included Alfred Wagstaff, Captain T. S. Baldwin, Christopher J. Lake, Arthur Johns, H. C. Drayton, Winslow Busby, A. P. Flagler, Jefferson Seligman, E. E. Schwarzkopf, W. D. Gash, W. E. Hutton, Samuel F. Perkins, K. M. Turner, George H. Guy, P. C. Hewitt, F. L. Hoppin, Waldron Williams, A. E. Gallatin, J. H. Wall and Samuel Robert.

These are all friends of Bishop who believed in continuing him as head of the club in return for the alleged good conduct of the club at his hands in the past. Strange to say, however, upon the posting of this ticket Bishop and Channing as officers, and Morris, Hawley, Edwards and McCoy named for governors, wrote a letter requesting withdrawal of their names from the insurgent ticket, and announcing that they had been placed on such ticket without authority or consent. Wagstaff thus had played on him the same trick that he played on the old insurgents a year ago, when he withdrew from their ticket.

The opposition wants to know what Ryan has done to further aviation outside of his work on the Belmont Park tournament. Clifford B. Harmon has many friends in the club who appreciate the fact that he is the only amateur flying in this country and want to see his activity where it will benefit the club.

Friction developed at the banquet of the Aero Club of America, and the tournament committee to the aviators, between Clifford B. Harmon and Alan Ryan. In this little tilt it was suggested to Ryan that he would "make a —— of a president," and the compliment was returned in like manner.

Plans for Club House.

For "materially adding to the comforts and benefits of the members of the club," the latest notice to the members states "the obtaining of a small club house in a convenient and desirable location" is "most important." No meeting of the members of the club has been held for a year, and it is a long time since the members have had advices of new members joining, as is required by the by-laws. What a club house will do towards benefiting the members, who have no part in the conduct of the club, is an open question.

The only time club members have been asked by the lordly custodians of its affairs was just before the Belmont meet, when they were begged to act as spotters at the "pylons" from 1:30 P. M. until the close of the day's flying, to keep track on record sheets of every aviator who passed that way, whether he "cut corners," etc. For this service one ticket of admission to the grounds was given each of the favored members, who were supposed to be herded in the club house when not on duty.

Among those who are supposed to be members, but announcements of whose applications for membership have not been sent out in accordance with the by-laws, is Alan Ryan himself. It is claimed by insurgents that to be legally a member, the other members must be duly notified in accordance with the by-laws; and it is further contended by insurgents that it cannot be in accordance with the by-laws, and, therefore, to vote for additional governors before the amendment increasing their number was legally passed.

Another feature claimed is that to suspend the by-laws while voting for additional governors required a unanimous vote in accordance with Sec. 2 of Chapter 10 of the by-laws, and not over one-third of the members present voted, while the balance did not vote at all. Yet it was called a unanimous vote, which was apparently not the case.

The same argument applies to the reduction of the initiation fees to $25 instead of $50 until March 1, 1911, those voting composing only a small unanimity of the members present.

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We carry in stock—immediate delivery:

Motors from 20-30 H. P. up to 60 H. P.

Monoplanes, $200.00, $350.00, $500.00, without power.

Biplanes, $500 00, without power.

2 Biplanes (fine flyers) in good condition with power. Prices on application.

"Camasco" Knock Down Planes from $150.00 up.
" Aero Wheels $4.50 up.
Unbreakable $6.25.

Naiad Cloth and Requa-Gibson propellers in stock. Genuine, Imported, Farman turnbuckles and eye bolts.

Agents:—Elbridge Motors, Parabolel Propellers, Naiad Cloth, all makes of Aero Tires, Detroit Motors.

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It is a motor that can be depended on to stay up and keep going as long as the fuel lasts.

Two cycle; 4½" bore and stroke; 2, 3, 4, or 6 cylindered.

Made completely of Aluminum. Our own exclusively devised Aluminum Cylinders with Cast Iron liners where pistons travel. (Patent applied for.)

Handsome beyond expression, resembling solid silver. Stronger than Iron or Steel alone. Very light, being Aluminum, and no factor of safety slighted. Gives more pounds pull per pound in weight than any other motor in the world.

A reliable, dependable, powerful motor made by responsible people, and fully guaranteed. Prompt deliveries, and prices right. Write us for particulars.

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¶ All kinds of aeroplane parts in stock and made to order.

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To Aeroplane Meet Promoters

MAN-CARRYING BY KITES

was for the first time in America demonstrated as an attraction at the Harvard-Boston Aero Meet.

There it was shown how easily a man could be sent 200 ft. in the air supported by from 6 to 15 enormous 18 ft. passenger carrying kites.

The height to which he can go (up to 1,000 ft.) varies only with the wind velocity and nerve of the operator.

The Army officers present testified as to its great value for scouting purposes in war.

¶ As this feature is at its best when the winds are so strong that the aeroplanes cannot fly, it is especially valuable as an attraction at Aeroplane Meets.

SAMUEL F. PERKINS, 110 Tremont St., Boston, Mass.

The **Aero Club of New England** will observe the 127th anniversary of the first ascension of man in a balloon, and hold its annual banquet at the Hotel Somerset, Commonwealth Avenue, Boston, on Monday, November 21, at 7 P. M.

Among the invited guests who expect to be present are Walter Wellman and his engineer, Melvin Vaniman; Augustus Post, of the balloon America II, the world's champion long distance balloonist and winner of the recent international balloon race; Samuel F. Perkins, a member of our club, who sailed in the balloon Dusseldorf in the same race; Mr. Claude Grahame-White, the noted English aviator; and Mr. Wilhelm Heinrich, the first sightless person to make a balloon ascension.

The annual meeting of the club will be held at 6 o'clock at the same place, at which meeting the question of purchasing an aeroplane will be discussed.

The Williams Aeronautical Society was formed on October 13 by students at Williams College, Williamstown, Mass., with H. Percy Shearman, the prime mover, president; George Orr Latimer, vice-president; Robert O. Starrett, secretary; R. K. Johnson, treasurer. Thirty men started the organization, which doubled itself in three days. A balloon ascension is being planned under the auspices of the club, and a course of lectures will be given during the winter by prominent men in the art. A library will be formed, and a construction committee has been appointed, on which are several men who have had practical experience. The services of Glenn Curtiss and Leo Stevens will be sought as consulting engineers. Stevens has already accepted.

President Shearman has designed a "flying bobsled" to be used during the winter. After a winter of active and systematic work it is possible an aviation meet will be held in the spring.

The Aeronautical Society listened to an interesting and valuable talk on November 10th by Mr. R. C. Gildersleeve, of the El Arco Radiator Co., on the subject of the "Cooling of Motors." Edward Durant was another speaker on the subject of the gyroscope.

To promote and diffuse a more technical knowledge of the science of aviation among the members of the society, the following list of subjects covering the art has been arranged, upon which members are invited to write essays to be read in regular meetings of the society: "Aerodynamical Formulae and Calculations," "Planes," "Aeroplane Stability," "Propellers," "Aeroplane Construction," "Motors," "Learning to Fly." Benjamin B. Carmina has offered a gold medal to the one who, writing upon the seven subjects, shall be adjudged to have presented the best series. Other prizes will be offered for separate essays.

The society has issued two more of its "Bulletins" giving verbatim accounts of talks and addresses delivered before the society since its formation practically. These are of absorbing interest.

At the prior general meeting, held Oct. 27th, the speakers were Mr. Harry M. Horton, on the "Application of the Wireless Telegraph to Aeroplanes," and Mr. Melvin Vaniman, the engineer of the Wellman airship "America."

Mr. Horton's adddess outlined the difficulties encountered in making apparatus light enough and yet sufficiently powerful to send impulses several miles, and the best results so far obtained were with an outfit weighing 30 pounds, used by Mr. J. A. D. McCurdy at Hammondsport, which had reached 40 miles.

Mr. Vaniman gave a most instructive and impromptu recital of experiences with the airship "America," beginning with his first meeting with Mr. Wellman in Paris in 1906, when the work commenced. After completion, the ship was taken to Spitzbergen, where endless difficulties were encountered in efforts to reach the North Pole, and finally the last trip, starting from Atlantic City, until rescued by the S. S. Trent after a record flight of three days, having traveled nearly 1,000 miles. The greatest source of trouble was the equilibrator, of which so much has been heard, and yet Mr. Vaniman is convinced that without it no success can be obtained, the unfortunate experience met with on their voyage being due to storms and 40-mile winds, which are always likely to upset the most carefully laid-out plans.

The **Dayton Aeroplane Club** held a smoker and banquet on November 2. Among those who responded to calls were E. W. Shroyer, A. E. Estabrook, Dr. O. J. Needham, G. R. Wells, Postmaster F. G. Withoft, Dr. J. C. Eberhardt and A. G. Clark. Dr. Eberhardt was one of the judges in the recent Belmont Park international aviation meet, and his talk was unusually interesting, as he made extensive comment upon the recent flights and their significance to the development of aerial navigation.

Business was taken up and the question of the erection of an aerodrome was discussed.

An Aeronautical Club is to be formed at the University of Michigan, Ann Arbor, Mich. At a meeting of the students held to discuss the matter over a hundred were present. Regular meetings will be held for the reading of papers and the holding of arguments, and later on it is hoped to do some practical work.

Professor Herbert C. Sadler is working on some apparatus for experimenting upon aeroplanes and propellers, and it is expected that work along this line will be started the first of the year. It is also probable that some regular work will be offered by the University at the beginning of the second semester.

The **Walla Walla Aero Club** has been incorporated for $5,000, at Walla Walla, Wash., by L. E. Meachan, C. S. Walters, C. R. Offner et al.

It might not be a bad idea if the various aero clubs in the country held members' meetings once in a while. The Aero Club of America had no members' meeting, or lecture, until the annual election, for about a year. The Aero Club of Michigan has had but its organization meeting. The clubs in this country that are other than but a name could be counted on the fingers of one hand—and there are more than eighty so-called "clubs."——"But what's the use?"

A NATIONAL ORGANIZATION

MORE than ever before is there a need for a national organization that is national. Foreseeing the present, many active clubs urged such a body a year ago, and succeeded in gathering together the delegates for a big national league.

Lulled by the siren song of the Aero Club of America and enticed by magnified promises, the delegates were cajoled into forming the "national council of the Aero Club of America." Once subdued, the A. C. A. proceeded to forget its child. Not a cent of dues has ever been paid in by the clubs belonging, and nothing has ever been heard of the "council" since its relegation to oblivion.

With the Aero Club of America in a worse state than ever before, likely to lose its foreign affiliation the moment there is a national organization of the proper kind to contract an agreement, the present "council" dominated by the A. C. A., it is high time that club men with red blood in their veins, interested in the actual progress of the art, get together and evolve the right kind of a broad, really, truly democratic national body; or else resurrect the "national council," perform a few amputations, add the clubs now outside, put the Aero Club of America on the same basis as the other clubs, and DO SOMETHING.

Index for Volume 7.

Index for Volume 7 will be printed in the January number.

The English "The Car" seems to have it "in" for Americans. First it has Hamilton and Walden in the death list, and next it says that Ogilvie and White were the only two to complete the Gordon Bennett course. Then, too, the international balloon race results gave America "a new record for this sport in the New World." With the exception of de la Vaulx's record, and within 20-odd miles of that, it seems to be pretty nearly a world record for balloon races.

Since the famous flight of Henry Farman, in January, 1908, says "Conquete de l'Air," when he won $10,000 for a flight of but 1 kilometer, one can estimate the prizes received by aviators at $600,000. The biggest winnings have been made by Leon Morane, perhaps, who, since the meeting at Rheims in July of this year (in three months) has won $60,000.

PRINCIPAL FOREIGN EVENTS

Flies with Passenger from Paris to Brussels and Return.

PARIS, Oct. 16.—Henry Wynmalen, the Dutch aviator, recently holder of the world's altitude record, and M. Legagneux, the French aviator, each with a passenger, made a remarkable trip in biplanes to-day from Paris to Brussels. They started from Issy with an interval of an hour and a half, in an attempt to win the $20,000 offered by the Automobile Club and the $5,000 offered by the municipality of Paris for the best flight with passenger to Brussels and return.

Wynmalen, after reaching the Belgian capital, with one stop on the way, started almost immediately on the return trip, and arrived safely that evening at St. Quenlin, where he spent the night. The next morning he started again. After three more intermediate stops in the morning, he arrived safely back at Issy. His passenger was Louis Dufour. Total time occupied was 28 h. 36 m. 43 s. for the total distance of 380 miles. The time in flight was 13:12:28.

Legagneux and Martinet, after making one stop going, started back the following morning, but got, after one stop, only as far as St. Quentin, where he damaged his machine in avoiding some spectators, and abandoned the trip. Both used Farman machines.

First Two-Man Flight Over Paris.

Paris, Oct. 16.—Legagneux, with passenger (Farman), Wynmalen (Farman), and Maurice Farman (M. Farman) all maneuvered over the city of Paris, Wynmalen flying about the Grand Palais and around the Eiffel Tower. On the 19th Robert Thelen (German Wright) flew over Berlin. Lieut. Savoia (Farman) recently flew over Rome.

Military Aviator Killed.

Douai, France, Oct. 23.—Capt. Madiot, military aviator, was instantly killed flying for the first time alone a Breguet biplane. Previous flights had just been made by M. Breguet with Madiot as passenger, and even with two passengers.

An examination of the machine showed all wires intact. Accident evidently due to personal equasion.

German Duration Record.

Darmstadt, Germany, Oct. 24.—August Euler (Euler) made a new German duration record of 3 hrs. 6 min.

Military Airman Killed.

Magdeburg, Germany, Oct. 25.—Lieut. Mente fell with a Wright aeroplane and was killed instantly.

The lieutenant was gliding to the earth when he started his motor. The strain caused the machine to turn turtle.

The weather was bad, and he was the only one to risk a flight.

Aviator Blanchard Killed.

Paris, Oct. 26.—Fernand Blanchard, the aviator, fell from a height of 100 feet and was killed.

The accident occurred over the field at Issy-les-Moulineaux, where M. Blanchard was gliding down after a successful flight from Bourges, about 125 miles.

MM. Blanchard, Bregi and Bielovucci, who had participated in the aviation meeting at Bourges, decided to return to Paris through the air. Bregi arrived first, having covered the distance from Bourges to Paris in 4 hrs. 10 min. Blanchard was a close second, and was hovering over the aviation field at Issy-les-Moulineaux as though selecting a convenient landing place, when his Bleriot, for some unexplained reason, fell like a stone.

World's Record Again Broken.

Buc, France, Oct. 28.—M. Tabuteau broke the world's distance and duration records.

Flying his Maurice Farman biplane, fitted with an 8-cylinder 60 h. p. Renault motor, he started out with the intention of competing for the Michelin Cup for the longest distance covered up to the end of the present year.

Without the slightest hitch he continued to circle round the aerodrome hour after hour with remarkable regularity.

The aviator alighted after having flown for 6 hrs. 1 m. 35 s., having covered in a single flight a distance of 365 kil. (226.8 m.). He consumed 190 litres of gas and 20 of oil. The old record was that of Oliesclagers, 244.3 m. in 5 h. 3 m. 5 1-5 s.

Mathieu Flies from Paris to Brussels.

Brussels, Belgium, Oct. 29.—Mathieu, the French aviator who started with a passenger from Issy the previous day in a flight to Brussels in an aeroplane, but who was forced to make landings at Dravecy and Braine-le-Comte, Belgium, arrived here this morning. A night stop was made at Braine and the flight resumed in the morning.

It had been his purpose to start on the return voyage immediately, but he abandoned the return flight because of trouble with his machine.

Government Airship Sails Channel.

London, Oct. 29.—Announced that the government would buy the Clement Bayard airship, which sailed from Lamotte-Breuil, in France, to the shed erected by the London "Daily Mail" at Wormwood Scrubbs, on October 16. There were six in the crew and passengers, besides Alphonse Clement, the designer and builder. The distance is about 240 miles. This was accomplished without stop in 6 hrs. 16 min. Last year the Russian government bought the dirigible built for England. Then the French government requested the trip of the second airship delayed until after the army maneuvers this fall.

After some argument the War Office offered $62,500 for the airship without tests. Harvey Du Gros generously made up the balance of the $90,000.

The airship is known as the "Clement Bayard II.," 7,000 cubic metres capacity, 260 h. p. The average speed of the trip was 38.7 m. p. h.

Another Fatality.

Rome, Nov. 3.—Lieut. Saglietti fell with an Asteria biplane in which he was maneuvering today and was instantly killed. The machine was wrecked.

The officer had made a good flight, and was gliding down, when, at a height of about 50 ft. from the ground the machine refused to respond to the elevator. Lieut. Saglietti tried to jump clear of the machine, but fell, and the machine crashed on top of him, killing him instantly.

Second Airship to Cross Channel.

London, Nov. 4.—E. T. Willows and an engineer sailed an airship of his own design from Wormwood Scrubbs to Corbehem, near Douai, France. In landing the framework was damaged and on account of weather conditions the return trip was not made. The start was made at 3:25 P. M. At 10 P. M. the vessel was sent up to 5,500 ft. to clear the clouds and steer by the stars. At 2 o'clock in the morning the landing was made.

Cody Makes Record.

London, Nov. 4.—Capt. S. F. Cody, in trying to beat the British Michelin Cup record, flew for 2 hrs. 24 min., covering 94½ miles. This is the best record so far.

Skyscrapings.

The F. A. I. has fixed new rules for pilot licenses. Minimum age, 18 yrs. Two tests over closed circuit of 5 km., one for height of at least 50 m. Course in figure 8 around and between 2 posts 500 m. apart. Each flight to be ended by gliding with motor stopped, and within 50 m. of a point previously designated by entrant.

On October 29 Henry Farman carried four besides himself on a machine of more than usual surface. The load carried totaled 380 kilos.

According to a dispatch from Berlin, the German War Office has decided, as a result of the recent tests carried out by the military authorities, to buy five aeroplanes of different types, including a Wright, an Aviatik, a German-built Sommer, a German-built Farman, and an Etrich monoplane.

Count Lambert has made trial flights with a Gnome-engined Wright.

A number of French manufacturers have started suit in France to have the Wright patent annulled. It is claimed the system of warping was patented in 1900 by Theodore Dobresco.

Louis Paulhan has just been awarded the "Daily Mail" $5,000 for the greatest distance flown cross country between Aug. 15, 1909 and Aug. 14, 1910. His mileage was 801 miles.

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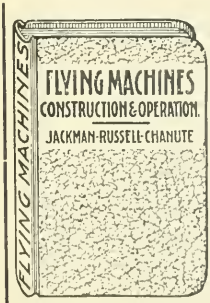

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IN THE AERIAL MARKET PLACE

TO OUR FRIENDS—We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

Curtiss Motors for Immediate Delivery.

Curtiss 25-h. p. motors can now be obtained with prompt deliveries, from G. H. Curtiss, Hammondsport, N. Y.

This motor is 4-cylinder vertical, water cooled and has a 3¾-in. bore and 4-in. stroke. The cylinders are castiron with copper jackets homogeneously welded on. Lubrication is by a force feed system, the pump being built in the case and operated from the cam shaft. The oil is fed through the hollow cam shaft to the main bearings, thence through the hollow crank shaft to the crank and connecting rod bearings, the overflow from the case returning to a separate reservoir underneath the motor from where it is again pumped through the system.

The crank case is of a special aluminum alloy and the crank shaft of Vanadium steel. The valves are both in the head and are actuated by single push rod and cam. All the parts of the motor are made of special materials secured expressly for these motors.

The weight, including the oil and water pumps, is 90 lbs. Ignition is regularly by Bosch high tension magneto, driven by enclosed gears. The magneto weighs 12½ lbs.

The motor develops 25 h. p. at 1,300 r. p. m., but has a maximum speed of 1,800 to 2,000 at which it develops considerably more. All the bearings are of very liberal dimensions.

Duralumin, a New Metal.

For years past a large number of inventors have been endeavoring to find some alloy which would combine with the light weight of aluminum the characteristics regarding strength and elasticity so far found only with the heavier metals. Attempts were made, particularly in Germany, to obtain an alloy of aluminum and magnesium, a metal even lighten than aluminum, and for a while it appeared as if the goal had been reached. From the weight of magnesium it follows of course that the specific weight of these alloys was even smaller than that of aluminum, decreasing more and more with the increased amount of magnesium added to the aluminum. The hopes entertained with regard to these alloys were disappointed as they soon disintegrated, becoming brittle and therefore useless.

The new alloy, to which the name Duralumin, i. e., hard aluminum—has been given by its inventor, consists of more than 90 per cent. aluminum, but small additions mainly of copper and magnesium, have changed its mechanical characteristics absolutely. From the fact that only a few per cent. of other metals have been added, partly heavier and partly lighter than aluminum, it follows that the weight of the new alloy is practically the same as that of the aluminum. The appearance of the alloy is also that of aluminum, retaining, however, its bright color unaffected by the atmosphere or water. Attempts at bending a rod or plate will soon reveal how the metal differs from aluminum, for while a good-sized bar of the latter material can easily be bent, the Duralumin pieces will show the resistance of steel. Technically speaking, the alloy shows, according to the particular mixtures used and according to the treatment it has undergone, a tensile strength of from 50,000 lbs. up to 85,000 lbs. per sq. in.; this means a rod of the latter alloy of 1 sq. in., cross section, suspended vertically will require a load of 85,000 lbs. to break it. At the same time the rod will weigh only about one-third as much as a similar rod of steel.

The importance of this new material, if the inventor's claims prove true, can hardly be overestimated, for while the alloy must necessarily be high in price when compared with steel owing largely to the fact that for its production aluminum is used as the raw material, there are many fields where the large reduction in weight will more than offset the difference in cost. The field is by no means limited to aviation, but in marine and automobile engineering it offers the greatest possibilities and will be used to a large extent.

The English government has under construction a large dirigible for which Duralumin will be used, and is also employing a considerable amount of it in connection with the construction of a new cruiser in order to test the capacity of the material for resisting the influence of sea water, one of the strongest claims advanced by the inventor.

The new alloy is being manufactured in Europe by various concerns, best known among whom are Vickers Sons & Maxim of England. Arrangements are under contemplation looking towards the production of the alloy in America. Marburg Brothers of 1777 Broadway, New York, are representing the inventor in this country and exhibited a few sample pieces for the inspection of those interested at their exhibition in connection with the Belmont Park meet.

The specific weight varies according to the particular alloy used from 2.77 to 2.84. The melting point is at 650 deg. C. According to the particular purpose for which the material is to be used an alloy can be produced which will show greater or less ductility.

Large Pennsylvania Tires.

The development of the aeroplane, which gives promise of so soon becoming of great utility, gives rise to the demand for a tire suitable to its special use.

The Pennsylvania Rubber Company claims to be one of the few manufacturers making a tire of 4 in. in diameter for this purpose, and these tires have been used with success by P. W. Wilcox, of Columbia University, Clifford B. Harmon and H. P. Dietz, of Mineola.

These tires are especially designed to withstand the shocks of alighting, and have little cushioning effect.

The 20 in. x 4 in. aeroplane tire which the Pennsylvania Rubber Co. are making is fast becoming very popular.

Two of these tires will carry a ten or twelve hundred pound flyer, and will have sufficient cushioning effect to prevent the jar of alighting being transmitted to its delicate framework.

Warner Moves Advertising Department East.

The Warner Instrument Co., of Beloit, Wis., makers of the well known Warner Auto-Meter, will conduct their advertising from their New England offices, 925 Boyleston Street, Boston, after December 1st.

Their advertising and the New England territory will be in charge of W. A. Merriam, who leaves Lord & Thomas, one of the country's largest advertising agencies, to assume this position.

The Warner Company are to be congratulated on securing a man of such prominence in advertising affairs to look after their interests.

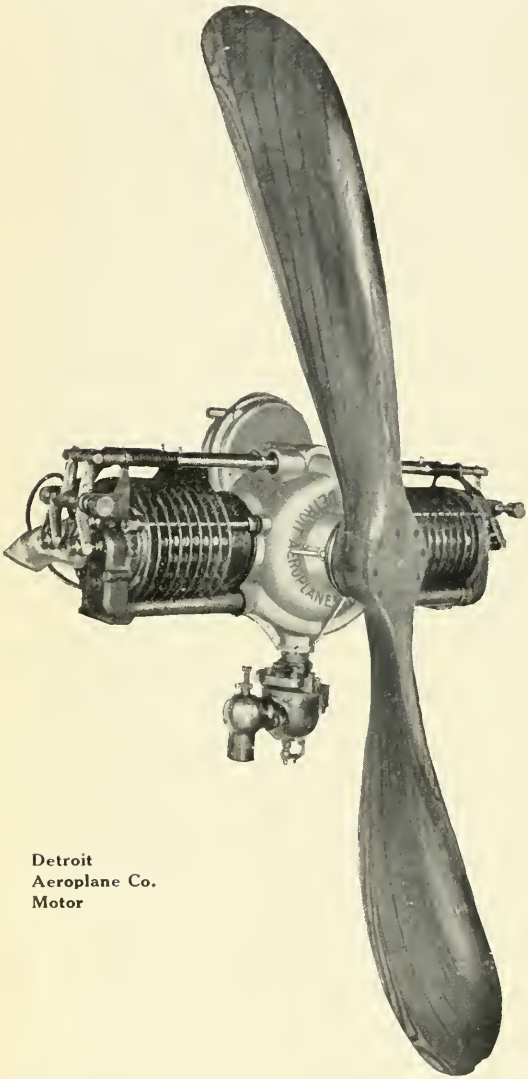
Mr. Merriam's advertising experience dates back some dozen years or more, when he was a charter member of the first regularly organized advertising department of Armour & Co., of Chicago.

After leaving this firm, he became advertising and sales manager for one of Chicago's wholesale clothing houses, and was later sales manager of the Brand Stove Company of Milwaukee, Wis., makers of "Famous" Stoves and Ranges.

In December, 1904, he assumed charge of the copy department of Lord & Thomas at the time their "Reason Why" copy campaign started the revolution in the advertising field. In this capacity Mr. Merriam was responsible for the production of the advertisements used by a very large number of the most successful advertisers in the United States. From this position he was promoted to the management of the merchandising department and sales aid department, which he leaves to assume the position of Eastern and advertising manager for the Warner Company.

Detroit Air-Cooled Motor.

In the field of aeronautics the air-cooled motor works under quite different conditions than in the auto camp. Here it is freely exposed to the cooling draft of the craft at full speed; there it is tightly enclosed in a metal hood. Besides this advantage offered by the nature of aerial flight, the Detroit Aeroplane Co. believes the construction of their double opposed type has helped considerably in the solution of the cooling problem. In this type of engine the cylinder heads in which the internal combustion occurs, are arranged several feet apart and are entirely separated by the hollow crank case and cannot radiate the heat one to the other.



Detroit Aeroplane Co. Motor

Besides that, the engine being air-cooled is especially designed for this purpose inasmuch as the valve sections of enormous area have been employed. The exhaust valve through which the burned gas departs into the air, for instance, is 3 in. in diameter. On the other hand, the extremely large air-cooling flanges which run over the whole cylinder surface has been arranged at double the distance that customary practice shows. This is done to avoid the reciprocating action of the radiation from one rib to another and has been thoroughly tested out on French and German motors.

By means of the double throw crank shaft the pistons are forced in opposite directions, and as a result a stream of air is thrown steadily inside the crank case and cylinder by each revolution, which helps considerably to lower the temperature of piston and cylinder walls. All this in connection with the wide spread of the cylinder heads, which are directly exposed to the air draught of the propeller warrants a most efficient cooling under propeller load.

Tiger Cycle Works Increased Plant.

The Tiger Cycles & Aeroplane Co., 782 Eighth Ave., New York, has improved its welding and brazing plant so that it can repair any and all broken parts of motors. The company can also undertake to build on short notice light steel tube frameworks which, it believes, will sooner or later be used in preference to wood. A loft of 5,000 square feet has been secured to give room for building complete machines. Wheels and tires can now be supplied as follows: 14 in., 16 in., 18 in., and 20 in., x 1⅝ in., 1¾ in., and 2 in.; and 20 in. x 4 in.; 26 in. and 28 in. x 2¼ in. and 2½ in.

The name of the company has been changed from the Tiger Cycle Works Co. to the Tiger Cycles & Aeroplane Co.

New Rotary Motor.

As a result of experiments in improved aeronautical motors of the rotating cylinder type of Emile Berliner, of Washington, D. C., a company is being organized and a plant erected for the manufacture of aeronautical motors on a large scale.

El Arco Twin Radiators.

Recent twin radiator installations have been furnished by the El Arco Radiator Co. to Philip Wilcox (two 38 H. P.), Monmouth Aerial Co. (two 23 H. P.), Miss E. L. Todd (two 45 H. P.), Rexford M. Smith (two 38 H. P.).

H. W. DuPuy has recently taken a 90 H. P., J. J. Frisbie a 60 H. P., Glenn H. Curtiss a 70 and 75 h. p., B. F. Rochrig a 60 h. p., and another to C. C. Barnett.

Some Details of the Rinek Engine.

In view of the remarkable flight which resulted in the first tryout of Miss E. L. Todd's aeroplane at Mineola the past month, a few particulars of the Rinek engine which made possible the success of the machine will not come amiss, as these engines without a doubt are coming to be recognized as one of the most perfect types of engines on the market to-day.

The engine used on Miss Todd's plane is of the eight-cylinder "V" type, nominally rated 60 h. p., which power develops at 1,200 r. p. m.

The eight separate cylinders of these engines are arranged in two groups of four on a common "V" shaped crank case, sets being at right angles to one another, employing a four-throw crank shaft, each pin carrying the connecting rods of a pair of opposite cylinders, which are staggered in relation to one another. The cylinders, which are of a special grade cast gray iron, are machined inside and out, which insures the walls being of uniform thickness, thereby obtaining equal expansion and contraction.

The cylinders being of uniform capacity, it naturally follows that uniform compression is also obtained, and so perfect balance. Jackets are of hard spun copper, pressed on in a special manner, making a water jacket which is guaranteed to be absolutely water tight under all running conditions. By this special process, joints are produced that have entirely done away with the troubles experienced by others who have tried to depart from the practice of casting the jackets with the cylinders. This arrangement insures a perfect circulation which cannot exist in a cylinder whose jacket is cast with it, since in that case it is necessary to have the webs between the cylinder and jacket, which naturally form a bar to perfect circulation. In addition to this, it must be remembered that

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NICKEL PLATED TURNBUCKLES,
Very Light and Strong, - each, 12c.

Elbridge Special Feather-weight, 2-Cycle Aero Motors (water cooled):
3 Cylinder, 30-45 H. P., 138 1-2 lbs. . $750.00
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Cylinders 4 5-8 x 4 1-2, copper jackets, aluminum bases, hollow crank shaft.

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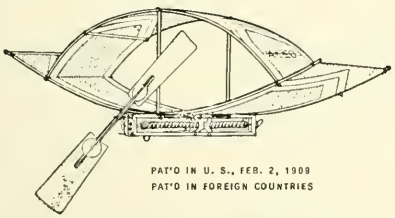

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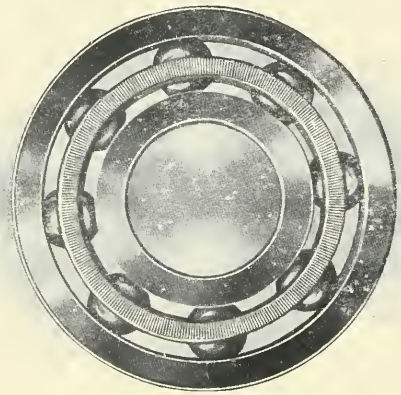

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the copper jackets themselves materially assist the process of radiation, owing to their high conductivity.

The connecting-rods, which are of a special metal, actuate a four throw crank shaft with cranks in pairs at 180 deg. Crank shafts are of the highest grade of chrome nickel steel alloy, special heat treated and hardened, and accurately ground to size. They are fitted at one end with a double ball thrust bearing, to take the "pull" or "push" of the propeller when fixed direct on the crank shaft.

The single cam shaft operating all the valves is hollow, of high grade chrome nickel steel, and carries the eight double-acting cams, each of which operates both the exhaust and the inlet valve on each cylinder, by means of overhead rockers, the vertical tappet rod of which is designed both to "pull" and to "push."

The valve cages, which are inclined in the head of the cylinder at 20 deg., contain the two valves, which are of a special nickel alloy, and in accordance with late practice, extremely large.

The valve springs are taper for lightness, and are kept in place by a very neat form of collar and cotter.

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Pistons are of the same grade iron as the cylinders, in order that they may have the same degree of expansion, and are ground taper to allow for the greater expansion of the head where the heat is the greatest.

The lubrication of the various parts of these engines is insured by a constant circulation of oil, under pressure from a force pump actuated by an eccentric on the crank shaft, and fed by a pump leading from a sump under the centre of the base chamber. Oil is maintained at a constant pressure by means of an adjustable bypass on the distributor. By this system all attention to lubrication is obviated, the engine attending to its own requirements under all flying conditions.

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The Burgess Co. & Curtis, of Marblehead, Mass., are building seven biplanes on order for Claude Grahame-White. As Mr. White is familiar with the product of almost all the principal foreign manufacturers, his indorsement of the Burgess-Curtis factory is to be very much appreciated. The standard Burgess-Curtis biplanes are, of course, being turned out in addition.

The Harriman Motor Works report re-orders have been received for 1911 model 50 h. p. by them from James E. Plew, 240 Michigan avenue, Chicago, and M. A. Marquette, of Indianapolis, Ind., who has a large Curtiss-type. Plew has a 30 h. p. in his Curtiss and will use the 50 in his Farman type. Louis G. Erickson, of Springfield, Mass., has bought a new model 50 h. p.; William Gary, 70 Lincoln avenue, Totaway Borough, Paterson, N. J., is another purchaser.

The California Aero Mfg. & Supply Co. report the sale of two Elbridge motors, one of 40-60 h. p. to Head & Goodman of Chico, Cal., and one of 60-90 h. p. to the Western Aviation Co. of Oroville, Cal. Mr. Ovar Meyerhoffer, manager of the latter company, is superintending the construction of a large machine, built according to their patents, in the California Aero Mfg. & Supply Company's shops.

The appearance of the new aeroplane built by Walter Christie, with two big star-shaped engines driving two propellers, in opposite directions, brought out the suggestion that it would be a good scheme to appoint holders of electric chair certificates to the jobs of piloting all freak flying machines, with freedom as the reward if they make good.

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WANTED.—Someone to finance cost of a complete motor for a biplane to be used in an attempt to win prize offered for flight across continent. Address F. C. Hild, 410 Douglass Street, Brooklyn, N. Y.

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COMMUNICATIONS

Transmission Device

517 Commonwealth Ave.,
Salt Lake City, Utah, Oct. 22, 1910.

To the Editor:

Inclosed is a sketch of my own idea, suggesting a special sprocket wheel for a propeller shaft that might be used in connection with running two motors to one propeller shaft of an aeroplane. Each motor drives the propeller shaft through the sprocket wheel rim, pawls and ratchet wheel hub, the latter being keyed to the shaft. In case one motor stops, the propeller shaft can still rotate, driven by the other motor, while the rim of the sprocket wheel from the dead motor remains stationary, the ratchet hub sliding over the pawls, which are connected to the rim. This would remove all trouble of a friction clutch or tight and loose pulley.

I ask you to please publish this in "Aeronautics" to prevent anyone attempting to patent it.

Yours truly,
H. F. WEBB.
Member of the Aero Club of Utah.

Hearst Prize Open For Dirigibles

Editor "Aeronautics,"
New York City, N. Y.

Sir:

Referring to the prize of $50,000 which Mr. W. R. Hearst offers to the aviator who first completes the flight across the American continent within an elapsed period of thirty days, I am sure that the following suggestion—offered in the same spirit that actuated Mr. Hearst, namely, out of an earnest desire to stimulate the development of aerial craft that will prove of permanent service to mankind—will be accepted in good part.

First permit me to point out that the recent development of the aeroplane, although convincingly and abundantly demonstrating to the "man in the street" cleverly built machines that fly, has after all merely followed the data and the plans of Prof. Langley, who brought the atmosphere, its peculiarities and its movements within the exact sciences, and of Prof. Simon Newcomb, who disclosed its abstract possibilities and limitations. The structural and mechanical development of the aeroplane, therefore, has been along the lines of perfection in detail, motive power, etc., rather than its broad fundamentals.

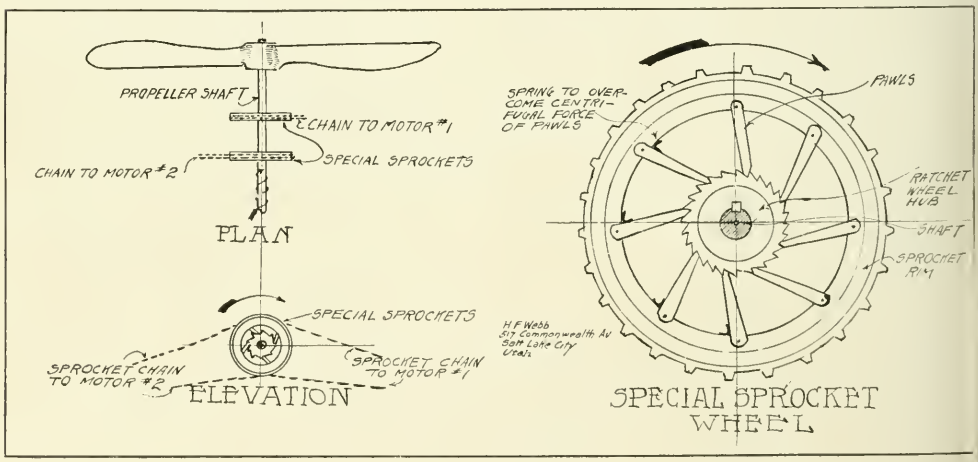
Now, the conditions under which the Hearst prize is offered, although they follow the general terms of the London "Daily Mail" prize and the Hudson-Fulton prize, confine the award to a machine already developed. A prize of this magnitude is potent of unlimited results in stimulating the development of aerial craft.

While the status of the art of aviation has risen in public opinion within a brief period from ridicule and scepticism to recognition and an abiding respect that abundantly compensates those who have earnestly led the campaign of education and the development of the science, there still remains some matters which should be impressed upon the public as well as on some aeronauts.

Abstract speculation leads the way, of course, in all research. In the building of machines by rule of thumb it is possible that inventions may be made by accident occasionally, but the great fundamental discoveries follow the lines of the application of known laws like those of Simon Newcomb; vide, the telephone and the phonograph. Now, in the matter of aerial navigation I propose to demonstrate that abstract consideration of the subject points to a machine that is barred from participating in Mr. Hearst's competition. Furthermore, the principles involved have, fortunately, already been demonstrated in two machines which have achieved all the world's records—save speed (which, of course, is merely a matter of design, engines, details).

Let me point out the fact that the speed at which the aeroplane leaves the ground is only twenty miles per hour. The Zeppelin and the Malecot (the new French military dirigible adopted as the result of a competition which was won by an obscure clerk who had studied engineering as a hobby) have both made approximately twice this speed. The conclusion is obvious that planes may be used for sustentation in dirigibles in the same manner that they are used in "aeroplanes." In point of fact, I have the statement of one of Zeppelin's engineers that a lifting force of 4,000 lbs. was actually exerted by the planes on the Zeppelin—although they were not placed there for this purpose. The records of the Zeppelin are: The largest number of passengers, 40; greatest distance, 950 miles; longest duration, 36 hours; speed, 38 miles per hour.

Contrast this with the aeroplane: Largest number of passengers, 5; greatest distance, 290 miles; longest duration, 6 hours; speed, 68 miles per hour.



Altitude records are negligible (although important) because the limitations are identical in both cases, provided only the power is sufficient.

Now, in order to point out the trend of progress it must be noted that this new combination of dirigible-plane (which, for lack of a better name has been called the "Transport") has several independent power units, and its efficiency and feasibility increases with size as the cube of its dimensions. It also has inherent stability.

In equipping an aeroplane with an additional engine many difficulties prolific of danger are involved. Its limitations as to size follow closely the prediction by Newcomb that its size will be limited by the fact that, while its weight increases as the cube of its dimensions, its lifting capacity increases merely as the square—so that a point is reached where it will not lift itself, a

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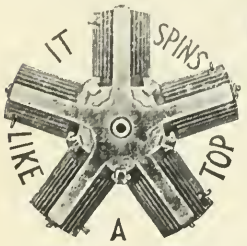

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demonstrated in a machine recently completed in this vicinity.

(It is to be regretted that Prof. Newcomb's treatment of the problems in aeronautics for the most part seemed to argue that man-carrying flying machines were impossible, even at the very moment when the Wrights were flying.—Ed.)

But the chief difficulty lies in its tending to pitch and dive like a kite—its lack of stability—and this is, and will be, the reason why its use will never extend to the average person. To overcome this difficulty the application of the gyroscope has been suggested; but any person who has seen the mechanical application of the gyroscopic force, and the insecure sliding bearing involved, will instantly dismiss the possibility of its service in aviation. Now, let me state that I hold no brief for the familiar dirigible inflated with hydrogen. As stated in a lecture before the Pasadena Club several years ago, I believe that nothing has served to retard the development of aerial navigation more than the discovery by Prof. Charles, in 1784, that hydrogen could be employed for buoyancy. In an article in "Aeronautics" for March, 1908, I summed up the limitations of this gas and pointed out dangers until then unknown.

I do, however, believe that the permanent value of the Hearst prize would be greater—even if the hydrogen dirigible were admitted—than if all similar craft be barred.

As strong an argument as any I can think of at the present moment, that the trend of progress in aerial navigation will be along the lines of the "Transport," would be the following examples: Supposing two aircraft, one an aeroplane and the other a dirigible, to be caught in a gale of, say, 70 miles per hour, blowing in the direction of its course, the aeroplane would have a minus lifting force, could not continue on its course, and the conditions would be right for a dangerous landing. (An aeroplane, as a matter of fact, does not lose lifting force going with the wind, owing to increased speed.—Editor.) The dirigible, on the other hand, would remain operative. Now, it has often been vaguely expressed in various places that if, on the other hand, the direction of the gale were reversed, the dirigible would, by reason of its greater surface, be retarded more than the aeroplane. It must be admitted that neither craft could be retarded more than the speed of the gale. It may be stated here that the question involved is one of comparative momentum as well as of surface, and the momentum of the dirigible in the line of flight is not in the least affected by its buoyancy—which is a vertical force only; on the other hand, as a large part of the momentum of the aeroplane is partly expended in the lift, and its condition is one of sustentation in the gale, it appears that the chief difference will be caused by the fact that the aeroplane is a small craft, with a small carrying capacity, whereas the dirigible is a large craft, with a large carrying capacity. Speaking of the dirigible, I refer, of course, to the modern "true ship of the air," and not to the obsolete gas bag with motor attached. I am speaking of a type of airship which does not exist in America to-day, and for that reason should be given the benefit of the stimulus of the Hearst prize.

I desire to state in closing that what is said above is not intended to belittle the possibilities of the aeroplane—on the contrary, I am, as ever, boosting the art where it needs boosting.

The conditions of Mr. Hearst's prize might be drawn to admit any type of aircraft not depending solely on hydrogen for sustentation and on propitious air current for propulsion.

Yours very respectfully,

CHARLEMAGNE SIRCH.

Half Interest for a Motor.

To the Editor:

Dear Sir,—Enclosed find small photo taken while I was working on my Curtiss type biplane. Same shows part of the center section assembled.

The machine is now complete and ready for installation of the power plant, which I am, owing to financial reasons, unable to obtain. I am willing to trade half interest in the entire machine for the use of a good motor.

I am nineteen years old, and have been working and experimenting in aeronautics for the last ten months. I have a twenty foot glider, of which I enclose a picture in flight.

I would like to get in touch with a firm wanting to try out a new motor. If you could help me do so it would be greatly appreciated. Yours very truly,

WILBERT L. HUNT.

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In the October number I published the strongest letter I could write and the results seem to have been negligible. Either I am a very poor letter writer or some of the subscribers to this magazine are an extremely hard-hearted group of citizens. I am only too glad to admit the former fact but what am I going to do if you won't "loosen up"?

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E. L. Jones

AERONAUTICS AND WAR.

(*Continued from page 189*)

ballast. If we throw out sand the balloon will rise again and what happened before will be repeated. More gas will be lost. Thus, during our voyage, there will be a continuous loss of gas, and loss of ballast, until through complete exhaustion of the latter we have nothing to cast away in order to assist the diminishing buoyancy of the remaining gas, and we find ourselves on the ground again. This is the history, in its main features, of the ascent and descent of a balloon in the atmosphere, under the most favorable circumstances.

We cannot remain aloft indefinitely, nor has any balloon, with a few exceptions, yet remained in the air 48 hours. Special conditions of the atmosphere likewise influence to a great degree the duration of the balloon ascension, and among them may be noted the varying temperature. In a clear air under a warm sun the gas will be heated, causing it to expand, which will increase the ascensional power if the balloon is not already full, and if it is, gas will be lost. Sheltered from the rays of the sun under a cold, damp cloud, the gas will condense, causing the balloon to descend through diminished displacement. We have now seen that the limitations to the duration of a balloon ascension are caused by the employment of hydrogen. Hydrogen, unfortunately for our purpose at least, obeys the same law as to expansion and contraction, under the influence of temperature and pressure, as the air. The hot air, coal gas or pure hydrogen is under the same pressure in a balloon as the air without. When the air expands, the hot air or gas in the balloon expands likewise. The pressure from without and the pressure from within are in equilibrium, which explains why a flexible bag of oiled silk remains inflated in the midst of an atmosphere which exercises such a great pressure in every direction.

The ideal arrangement would be a rigid envelope exhausted of its air—a vacuum balloon. Such a balloon would have an ascensiona force equal to the entire weight of the atmosphere displaced, less the weight of the envelope and equipment, and it would not be subject to any of the limitations as to the duration of an ascension, as in the case of the hydrogen balloon. But a spherical envelope of 1,000 cu. ft. displacement, in order to rise in the air under these conditions, would have to weigh less than 76 lbs. and support an external pressure of 500 tons. How a structure of such a force and weighing so little can be made with existing materials and kept airtight is not yet known. To make clear what this pressure is, which would crush any envelope enclosing a vacuum, it is useful to consider that the atmosphere is equivalent to a layer of water over the entire globe of 33 ft. in depth. Such a column of water, 384 inches in height, having a square inch section would weigh 15 pounds, and if its section were one square foot it would weigh over a ton.

NEW WRIGHT MACHINE.

(*Continued from page 192*)

In one of the Brookins machines the radiator was placed behind the rectangular gasoline tank, situated directly behind the aviator. In the others, the radiator was at the right of the motor, as is customary. All the Wright machines had Mea magnetos. The tires were Hartford.

It is unfortunate that the four cylinders out of eight in Brookins' racer should have gone back on him just as he was about to start on the Gordon Bennett, forcing a landing at enormous speed, injuring Brookins and smashing the machine, after it turned a complete somersault in the air after throwing him out.

LOS ANGELES NOVICE MEET.

(*Continued from page 209*)

it to rear backwards. It came down on its tail, fell over on one wing and rolled over on its back, smashing the machine. Mr. Duesler escaped unhurt.

Walsh Has Coast Record.

Tuesday, the 2d of November, Mr. Walsh remained in the air 23½ minutes, covering an estimated distance of 13½ miles at a height of 80 ft. He is using an Elbridge motor, and the Seely high frequency ignition system, put out by the Seely Company of Los Angeles. From present indications the club will have a number of local fliers at its next meet.

With the backing of the Merchants' and Manufacturers' Association the Aero Club of California had planned to hold a big mid-winter meet from the 9th to 19th of January, 1911, $75,000 to $125,000 to be put up in prizes. On account of the fact that the National Council of the Aero Club of America had assigned those dates to the Aero Club of Pasadena, of which Clifford B. Harmon is honorary president, the Aero Club of California had to abandon its project. At the present writing it looks as though there would be no meet in Southern California this winter worthy of the name.

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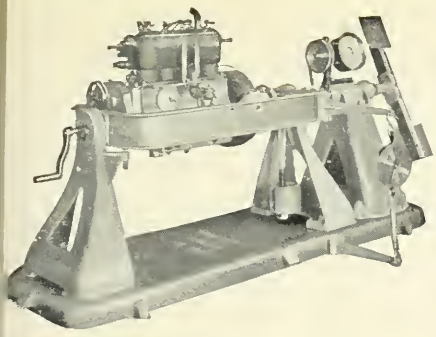

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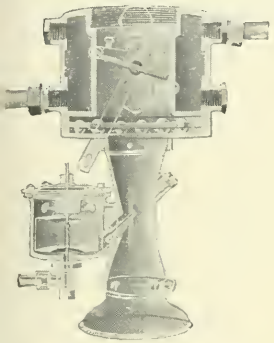

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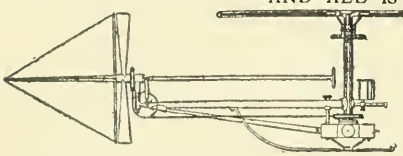

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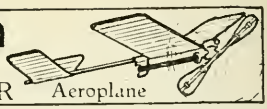

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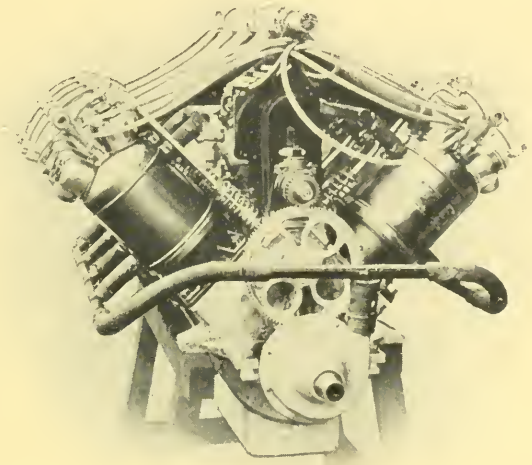

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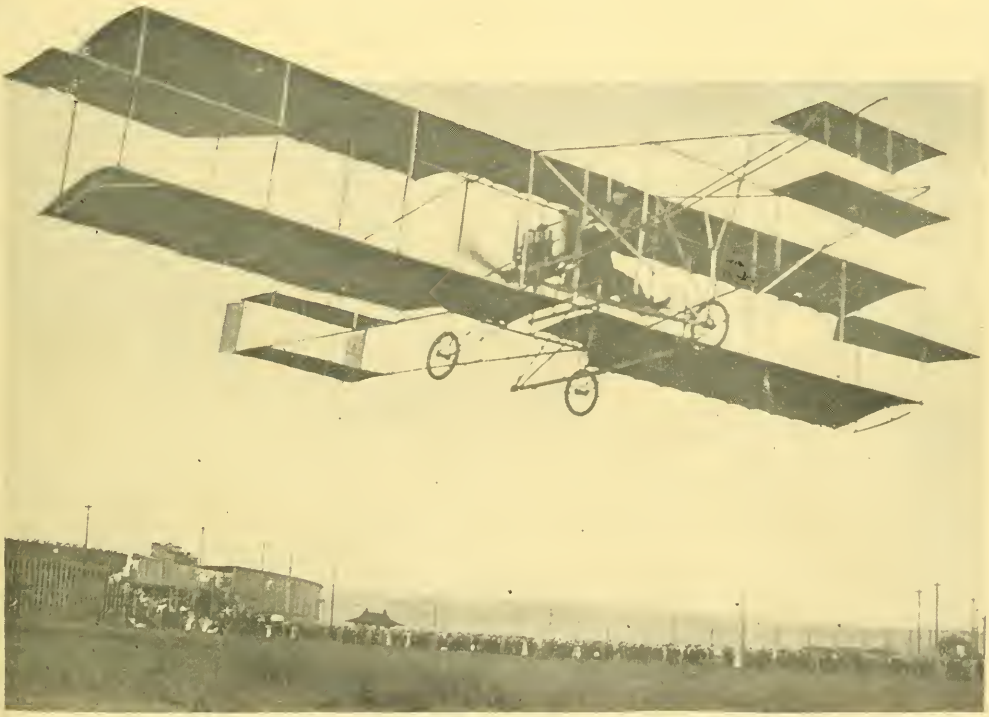

F. Walsh, flying at Amateur Meet, held by Aero Club of California, Los Angeles Motordrome. Walsh won every event, using 3-cylinder "Featherweight" Elbridge engine.

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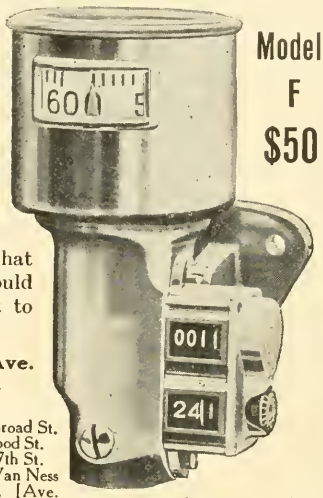

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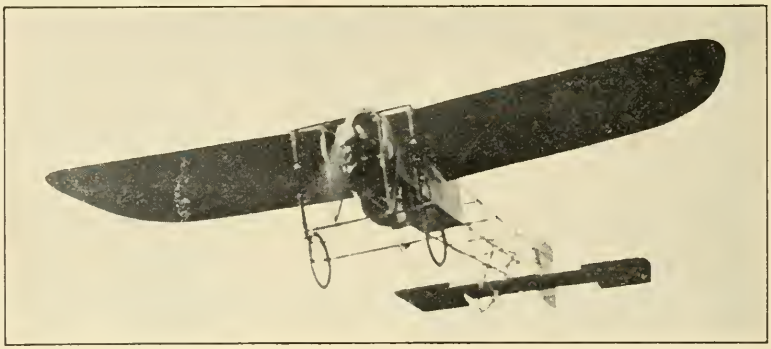

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NOTES ON THE AEROPLANE PROPELLER

A DISCUSSION OF THE RESULTS OBTAINED BY M. RIABOUCHINSKY

By Matthew B. Sellers

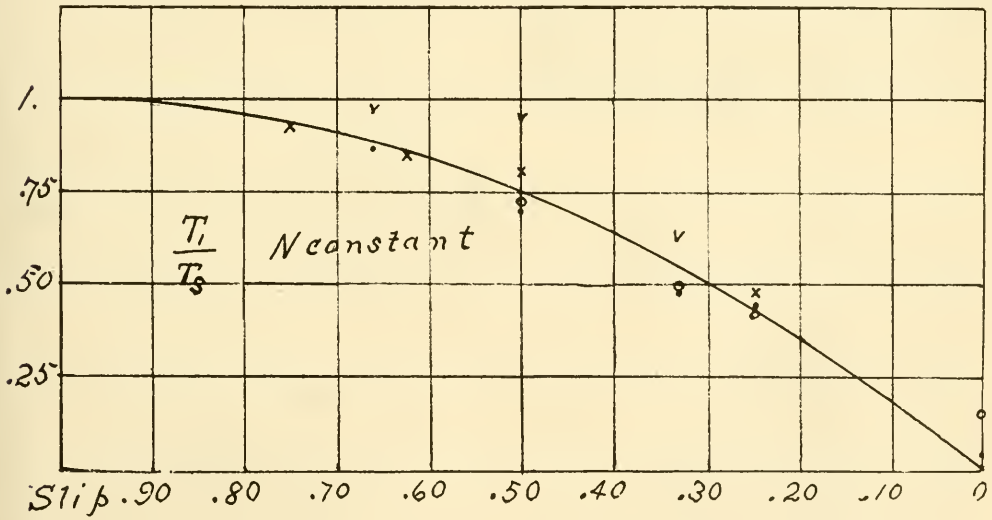
BY "standing thrust" I mean that obtained when a propeller rotates at a fixed point. A propeller advances when it moves forward while rotating. When the rotation of a propeller is kept constant while the advance accelerates, the thrust decreases. It might seem that this decrease would be in direct proportion to the slip; but as the propeller moves into undisturbed air the thrust is greater than this.

The experiments made by M. Riabouchinsky at the Koutchino Institute enable us to determine approximately this relation between thrust and slip. Those experiments were made with propellers one foot in diameter, the pitch being ½, 1, 2 and 3 ft. respectively. He does not state the form of blade used, but from what is said elsewhere I infer that the central angle was 18 degrees; the blade segmental and without cambre. The wind tunnel was used with three speeds of air current, viz; 10, 15 and 20 ft. per second.

At each speed the thrust was determined for various speeds of rotation of propeller; and curves plotted, one for each wind speed giving the relation of thrust to revolutions, for uniform advance.

I wish to determine the relation between slip and thrust for a uniform rotation of propeller. To do this I found by these curves, and tabulated, the thrust for each propeller at each available even number of revolutions for the three wind speeds, then reduced the revolutions to pitch speed; found the corresponding slip, and divided each thrust by the standing thrust at same speed, thus obtaining the ratio of thrust to slip at constant rotation for each propeller.

It is unnecessary to give these tables here, and I have not space to do so. In the figure, these values are plotted; the abcissas giving the slip ratio, and the ordinates the thrust ratio, taking the standing thrust as one.



Different marks are used to denote the propellers of different pitch and all values except those for the pitch ratio of 3, group themselves along a curved path.

I have found that a curve whose equation is $y=2x-x^2$ nearly corresponds to this path (and agrees fairly with the results of my own experiments). If, therefore, we use this equation, the thrust T_1 for any given slip S, will be $T_1 = T_s (2S-S^2)$ where T_s is the standing thrust of the propeller under consideration, and where the number of revolutions is constant. This, of course, is true only for the form of propeller blade here considered; a curved blade (i. e. with cambre), or one with

a rounded back will give higher values throughout and will give a thrust at 0 slip.

In order to determine the increase in revolutions necessary to maintain a constant thrust while the advance accelerates, I found from the plotted curves, the revolutions producing a constant thrust for the speeds of advance given; then computed the corresponding pitch speeds, and then the slip ratio, and then divided each pitch speed by the standing pitch speed giving the same thrust (i.e. $P \frac{N_1}{N_s}$).

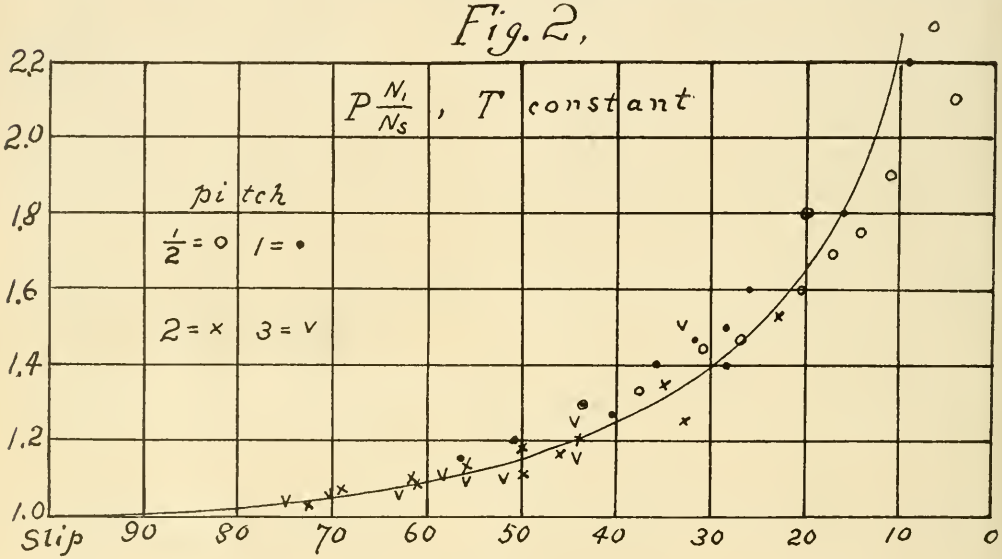
In Fig. 2, the abscissas give the slip ratio and the ordinates the pitch speed ratio. The curve there given has the equation $y = \frac{1}{\sqrt{2x - x^2}}$; and the revolutions at any given slip, to maintain the thrust constant would be $N_1 = \frac{N_s}{\sqrt{2x - S^2}}$, where N_s is the standing revolutions and N_1 those at the slip S.

It is seen that P does not occur in this equation, as the values show that the pitch has little (possibly negligible) influence on the rate of change of revolutions.

In applying this formula to practice, it must be remembered that owing to diminishing engine torque and increasing friction and edge resistance, the thrust does not remain constant, but diminishes.

Note:—For convenience, the origin is taken on the right in plotting the curves.

Fig. 2,



MY PARIS TO LONDON FLIGHT

By John B. Moisant.

MY Paris to London flight I started on my fifth flight in an aeroplane. The fourth time I flew was over Paris with M. Garros.

I got up at 9 o'clock and was told that Latham had started for London. My machine was not ready. By four o'clock it was half ready. My mechanic had asked for a ride, and I told him that at some time I would take him up. And this was the time he went up. We left at 5:45 at Issy les Moulineaux and flew across the city of Paris. Then I headed straight by my compass north by east, one quarter north, and at 7:40 arrived at Amiens, about 90 miles. If a man, however, steered by compass all the time he would never reach his point. When I got my aeroplane exactly on the compass in the direction I wished to follow, I looked as far as I could, which was probably ten or fifteen miles. Then I did not use my compass any more but steered exactly for that point. Sometimes I probably went to the north, east or west, but I made that point.

When I got to that point, which I knew was exactly in line with the city I was making for, then I took another point, fifteen or twenty miles off, until I arrived at Amiens and I was not over five hundred feet to the east.

The next morning I left at 7:30, fifteen minutes after Leblanc and Aubrun, for Calais, another 90 miles. There I had to steer by the map Leblanc had given me. At 9:30 I arrived in Calais, and I had never been there before either.

There were many, many people around offering all kinds of assistance, but I told them that what I really needed most was some castor oil. The motor will not go without castor oil. I got some gasoline and at 10:45 I was ready to make the trip across the channel. They all tried to persuade me not to attempt it because there was a storm coming, and not to carry a passenger. I said if I never get to London I will carry a passenger if he will come with me.

So at 10:45 I left for England, another place I had never been before, and I steered by compass. There was supposed to be a steamer to follow me, but remember the steamer makes about ten miles an hour and I made over forty. About five miles from the English coast I saw a port with steamers and I supposed it was Dover, the place I was making for. I was really making for Dover and I did not know there was such a place as Dean, so I got off my course and made for Dean, about five miles off the course. About that time a rainstorm came up

(*Continued opposite page 31*)

THE LIFE AND WORK OF OCTAVE CHANUTE

(To the majority of people the name Chanute has been associated only with aeronautics. Mr. Chanute was one of the foremost railroad builders of this country. The Kansas City bridge was declared impossible of construction. Mr. Chanute accomplished it. He built the Alton railroad. Following is a short sketch of his life, abridged from "Engineering News," N. Y., 1891.—*Editor.*)

Octave Chanute was born in Paris, France, February 18, 1832. He was brought to this country in childhood, was educated chiefly in New York City and began the practice of his profession as civil engineer at an early age.

After having done efficient work in railway construction in New York, Indiana, and Illinois, he became in 1863 Chief Engineer of Maintenance of Way and Construction of the reorganized Chicago and Alton Railroad, remaining upon that line until 1867.

During this connection, having been invited to submit a design for the proposed Union Stock Yards of Chicago, his plan was selected in competition with a number of others and he built these yards as Chief Engineer. He was also awarded a premium for a competitive design for a bridge across the Missouri River at St. Charles, Missouri. In 1867 Mr. Chanute went to Kansas City, Mo., as Chief Engineer of the bridge across the Missouri River at that point. This was the pioneer bridge across the Missouri River, and as the river pilots and riparian dwellers had given this stream a bad reputation, the successful completion of this bridge across it in 1868 attracted great attention and interest.

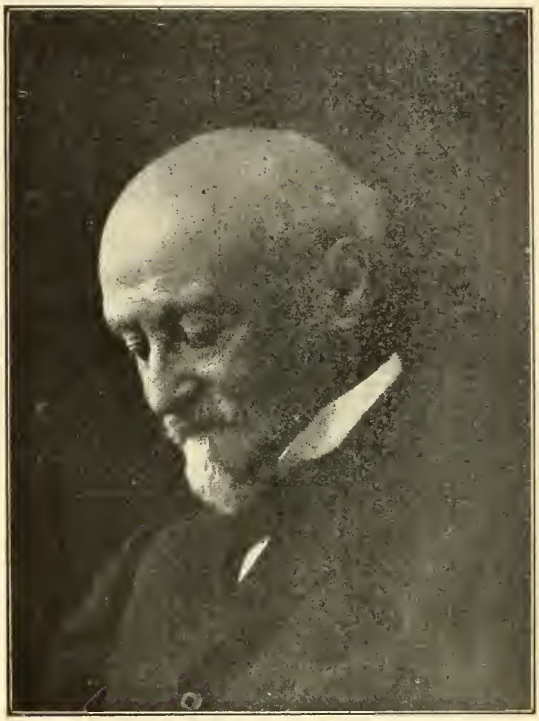
Later Mr. Chanute successively became Chief Engineer of the Kansas City, Fort Scott and Gulf, the Kansas City and Santa Fé, the Atchison and Nebraska and the Leavenworth, Lawrence and Galveston Railroads.

From 1873 to 1883 he was in the service of the Erie Railway as Chief Engineer. During this connection he readjusted the motive power of the road and lessened the grades so that the through freight trains, which averaged eighteen cars when he first became connected with the line, had grown to thirty-five cars when he closed his connection with the road in 1883, when he removed from New York to Kansas City, in order to look after his personal interests, and to open an office as Consulting Engineer.

In this latter capacity he took charge of the construction of the iron bridges during the building of the Chicago, Burlington & Northern Railroad between Chicago and St. Paul in 1885, and of those of the extension of the Atchison, Topeka & Santa Fe Railroad, from Kansas City to Chicago, in 1887 and 1888; the latter involving, besides a number of minor streams, the Missouri River bridge at Sibley, and the Mississippi River bridge at Fort Madison.

In 1889 Mr. Chanute removed his office to Chicago, where he engaged in promoting the preservation of timber against decay, by chemical methods.

Mr. Chanute became a member of the American Society of Civil Engineers, February 19, 1868, and has contributed a goodly number of papers to its Transactions.



OCTAVE CHANUTE

OCTAVE CHANUTE'S WORK IN AVIATION

By James Means

In October, 1891, there appeared in "The Railroad and Engineering Journal," of New York, the first of a series of articles on "Progress in Flying Machines," written by Mr. Chanute. The series was extended in the next two or three years and in 1894 was published in book form under the above title. It is a volume of over three hundred pages and it tells chiefly of failure. The author, bringing all of his resources as a skilled engineer to bear upon the unsuccessful experiments, analyzed the work done by scores of men and tried "to point out, as much as may be, the causes of failure."

In the preface to the book it is stated that one of the writer's objects in preparing the papers was "To satisfy himself whether, with our present knowledge and appliances, men might reasonably hope to fly through the air." He said that in his opinion "this question can be answered in the affirmative." It meant much to the believers in the possibility of mechanical flight to have the sanction of an engineer of the highest standing given to a discredited line of research.

In 1892 Dr. A. F. Zahm of Notre Dame (Ind.) University, now of Washington, D. C., proposed the holding of an International Conference on Aerial Navigation in connection with the World's Congress Auxiliary of the World's Columbian Exposition of 1893.

In this Dr. Zahm was heartily seconded by Mr. Chanute, who was made Chairman of the committee, Dr. Zahm being chosen Secretary. The officers of the World's Congress Auxiliary, of which Mr. C. C. Bonney was president, gave cordial cooperation to the plan.

The Conference took place in the Memorial Art Palace, in Chicago, August 1, 2, 3 and 4, 1893.

Mr. Chanute presided over the session upon the opening day, the topic for the day being "Scientific Principles."

In opening the Conference, he said:

"It is well to recognize from the beginning that we have met here for a conference upon an unusual subject; one in which commercial success is not yet to be discussed, and in which the general public, not knowing of the progress really accomplished, has little interest and still less confidence."

The paragraph just quoted well shows the status of interest in aerial navigation in 1893.

(*Continued on page 35*)

By Wilbur Wright

BY the death of Mr. O. Chanute the world has lost one whose labors had to an unusual degree influenced the course of human progress. If he had not lived the entire history of progress in flying would have been other than it has been, for he encouraged not only the Wright brothers to persevere in their experiments, but it was due to his missionary trip to France in 1903 that the Voisins, Bleriot, Farman, DeLagrange and Archdeacon were led to undertake a revival of aviation studies in that country, after the failure of the efforts of Ader and the French government in 1897 had left everyone in idle despair.

Mr. Chanute's own experiments have been quite fully described in papers written by himself in "The Journal of the Western Society of Engineers," for 1897, "The Aeronautical Annual," 1897; "McClure's Magazine" of June, 1900; "Cassier's Magazine," June, 1901; "Popular Science Monthly," March, 1904, and in numerous other publications. The grand object of his experiments was the attainment of automatic stability, his belief being that human intelligence would be inadequate to cope with the difficulties encountered in the tumultous aerial seas. Every machine he built had this prime object in view. As he stated in the Cassier's article, referring to his own experiments, "He has confined his endeavors wholly to the evolution of automatic stability." In carrying out this purpose he not only constructed a vast number of small gliders, but also proceeded to the construction of four different types of man-carrying gliders, in addition to the full size Lilienthal glider which he had constructed to begin with. In the "multiple wing" machine, the wings were mounted on vertical axes so as to swing backward at the tips when struck by a wind gust. The "double-decker" had an elastically mounted tail which yielded under the pressure of the wind. These machines were built and operated by Messrs. Herring and Avery in 1897. A third type, in which the curvature of the wings from front to rear was automatically variable, was undertaken under the superintendence of Mr. E. C. Huffaker in 1901, and partially tested in a small model, but the large machine was never finished. The "multiple wing" machine was rebuilt and tried by Mr. Herring at Wright brothers' camp at Kitty Hawk in 1902, but the results were unsatisfactory. In the same year a fourth method of obtaining automatic stability was tested for him at the same place by Mr. Herring. This was the "oscillating wing" machine built under his instruction by Mr. Lamson. In it the "triple deck" wings were mounted on a horizontal axis and were intended to oscillate as the wind pressure and center of pressure varied. It also failed to give positive results.

On the whole, Mr. Chanute's experiments were rather disappointing to him so far as his main purpose was concerned. As he said in the McClure article: "In my judgment neither of the machines above described is as yet perfected, and I believe it is still premature to apply an artificial motor. This is sure to bring about complications which it is preferable to avoid until the equilibrium has been thoroughly evolved." This view he consistently maintained through all the years of his active work. When, after the experiments of 1897, a wealthy gentleman of Chicago proposed to furnish the money necessary to construct a motor-driven flying machine, Mr. Chanute courteously but firmly declined the offer.

Mr. Chanute's active experiments closed with the trials of the two gliders above mentioned at Kitty Hawk in 1902. His increasing years, the difficulty of obtaining satisfactory assistants, and the growing prospect that the efforts of the Wrights to obtain a sufficient control by human intelligence acting through adjustable wings and rudders were the main factors in bringing about this result. On his return from Europe in May, 1903, he made a trip to Dayton and stated to my brother and myself that after thinking over the flights of the 1902 Wright glider, which he had witnessed at Kitty Hawk, he had come to the conclusion that whatever the final merits of the two systems might be, the first success would be obtained in all probability by our system, i. e., human control, rather than by his own system, i.e., automatic control. He then advised us to undertake the application of a motor and was much pleased as well as surprised when we told him that the designs were already completed for such a machine, and the work of construction well under way.

Although his experiments in automatic stability did not yield results which the world has yet been able to utilize, his labors had vast influence in bringing about the era of human flight. His "double deck" modification of the old Wenham and Stringfellow machines will influence flying machine design so long as flying machines are made. His writings were so lucid as to provide an intelligent understanding of the nature of the problems of flight to a vast number of persons who would probably never have given the matter study otherwise, and not only by published articles, but by personal correspondence and visitation, he inspired and encouraged to the limits of his ability all who were devoted to the work. His private correspondence with experimenters in all parts of the world was of great volume. No one was too humble to receive a share of his time. In patience and goodness of heart he has rarely been surpassed. Few men were more universally respected and loved.

At a general meeting of the Aeronautical Society, held December 1st, 1910, the following resolution was unanimously passed upon the notification of the death of Mr. Octave Chanute, an honored and honorary member of this Society:

"Resolved, that in the death of our esteemed honorary member, Mr. Octave Chanute, we, the members of the Aeronautical Society, as well as all interested in the art of aviation, have met with a severe and irreparable loss. We recognize Mr. Chanute as practically the founder of the science of aviation who was many years in advance of others, having written and published in 1894 the book 'Progress in Flying Machines,' which is to-day, after sixteen years, still a standard work of knowledge and information.

"Resolved, further, that this Society has lost one of its most earnest and sincere friends who honored us with many valuable trophies to be competed for under our auspices and favored us with instructive addresses which we shall always hold in grateful memory.

"Resolved further, that a copy of this resolution be forwarded to the members of his bereaved family with the heartfelt sympathy of all the members as a slight mark of their respect and sincere gratitude."

Acknowledgment was made by Mr. C. D. Chanute, son of the deceased, and his letter follows:

O. CHANUTE & CO.

Mt. Vernon, Ill., December 5th, 1910.

"Mr. Lee S. Burridge,
First Vice-President,
The Aeronautical Society,
New York, N. Y.

My dear Mr. Burridge:

"Will you please accept the appreciation of my sisters and myself, for your kind words of sympathy in our hour of trouble and also for the kind expression of regard toward our father.

"Father passed peacefully away Wednesday morning, November 23d, just falling asleep and never waking up. He suffered absolutely no pain, and was conscious a few minutes before dissolution took place, but his poor body was so worn out that when he fell asleep the machinery simply ran down, and he left us.

"Will you kindly thank the members of The Aeronautical Society for their token of regard, and for their words of comfort to us, as we feel deeply touched for the esteem in which our father was held by the members of the Society.

"Thanking you again for your kindness, I am

Yours very truly,
(Signed) C. D. Chanute."

The Aero Club of America appointed a committee to draft a set of resolutions, which will be suitably engrossed and forwarded to Mr. Chanute's family.

THE FALLACY OF THE SCREW PROPELLER

By C. Wesley Howell, Jr.

POSSIBLY the caption of this article may create adverse criticism, and if so it will have accomplished its purpose, because the discussion which may arise will undoubtedly be of benefit to all interested in the aeronautic art.

The screw thread is essentially a mechanical device or expedient of fixed principle, standard and result, and any deviation or defect in its construction or effect makes it either useless when constructed of metal or other solid material of great resistibility, only partially efficient when employed in the heavier fluid mediums such as water, oil, etc., or of comparatively small efficiency when used in air, which medium has little resistibility, and in setting forth the reasons that have led to the conclusion that the screw propeller theory is not tenable, reference will be made to metallic mediums as the extreme in one case and to free air in the opposite case.

The cutting of correct or efficient screw threads is not a simple operation even when metallic bodies are employed, because the same tool will not cut the same thread in different metals, as is evidenced by the fact that when one desires to tap an internal thread in brass, the tapping size of the hole must be different than for steel, and when one desires to cut an external thread or screw the body or working diameter of the metal must be either larger or smaller for different metals, the reason being that the tool in either case does not cut the metal cleanly but owing to the different ductile qualities of the metals sets up a distortion of the particles which must have an outlet, the result being that these distorted particles are forced or forged into filling up the allotted clearance space between the bottom or top of the threading tool forming the "V" or knife edge of the thread.

It may seem absurd to state that with a thread die of given pitch, say ten to the inch, it is possible to cut anything but that number of threads, but it is true that by canting the die double that number may be cut, but these threads are without character or strength and are incapable of performing useful work. Also under certain conditions, notably when a thread of great length is desired, unless great care is used there is a lack of pitch precision and slightly more than ten threads per inch may result owing to lateral distortion of the metal and heating of the material which on cooling will contract, drawing the threads closer than the pitch distance.

If the body diameter is greater than the finished size of the thread, the die does not follow pitch lines but acts as a hollow mill and a stripped thread will result. If the body diameter is not large enough to allow for a proper amount of distortion the top of the thread will not form but will be flat with a consequent loss of outline and strength. If the die is not properly aligned in its holder a staggered or "drunken" thread sometimes will result. It will thus be seen that under several conditions a loss of efficiency will result in metallic threads which are analogous to the so-called "slipping" of an aerial propeller.

Therefore it is reasonable to assume that if distortion occurs when cutting a thread in a solid substance of great resistibility, there must be a very great increase of distortion when cutting a thread in such an elastic medium as air, which has little normal resistibility, and that this distortion is analogous to the disturbing of the air by a rotating propeller.

Most investigators of aerial propellers arrive at the conclusion that the less a propeller disturbs the air the greater its efficiency and that a theoretical propeller of infinitely minute thinness and weight would travel through the air without disturbing it, its exact pitch distance when rotated one revolution, if we disregard the frictional surfaces of the blades, but as it is impossible to construct such a propeller or avoid frictional surfaces, the problem must be resolved with a propeller constructed for practical work which must necessarily have thickness, weight, area and frictional surfaces. Such a propeller will set up disturbances in the air which practically preclude it being considered as a screw because these disturbances influence or distort the air and it does not offer the necessary resistibility for cutting a screw thread.

It is well known that aerial screws never travel their pitch distance during one revolution, which is easily determined by dividing the distance traveled by the number of revolutions per minute and the loss in pitch distance is analogous to a stripped metallic thread.

Let us take for example a propeller of 10 ft. diam. and 10 ft. pitch. Theoretically it will travel 10 ft. in one revolution and will act on a column of air 10 ft. in diam. and 10 ft. long. In practice it will really travel 6 ft., the loss being 40 per cent., and will therefore only act on a column of air 10 ft. diam. and 6 ft. long. Now the propeller blades, if the screw theory is correct, are cutting two threads or helices in this air column which, owing to the thickness of the blades and stripping caused by their not traveling on their pitch angle, are of greater width than the design of the blades calls for. These helices represent displaced air which also disturb the surrounding air for a considerable distance, which we may safely assume to be at least 8 in. each side of the blade.

This may be demonstrated diagrammatically as in Fig. 1. The shaded portions represent the disturbed air, the two central lines indicating the area disturbed by the thickness of the propeller blades, plus the loss of pitch efficiency. The shaded portion in front of this area is the disturbed area caused by air banking and the area in back is a partial vacuum caused by the forward travel of the propeller, and as we cannot reasonably assume that there is a sharp line of demarcation between the undisturbed and disturbed

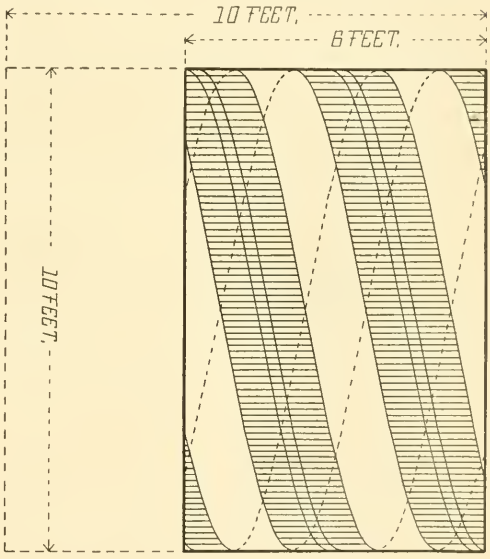


FIG. 1.

air such as the drawing shows we must assume that even the area shown as undisturbed is permeated with and subject to eddy currents and is more or less attenuated.

A column of air 10 ft. diam. and 6 ft. long will contain 451.24 cu. ft. of air weighing 36.09 lbs. Now, owing to thickness of propeller blade, loss in angular efficiency (slipping), banking of the air in front and partial vacuum in the rear about two-thirds of the air is disturbed, leaving one-third, or 12.03 lbs., to force the propeller to follow pitch lines. Since the propeller is giving a forward thrust of say but 240 lbs., it is not reasonable to assume that 12.03 lbs. will offer any resistance whatever to such a thrust, but on the contrary whatever resistance it has is broken up and the air itself carried away with the air expelled by the propeller. Even if we assume that the entire contents of the column of air is acted upon we cannot consider that its 36.09

lbs. of weight will offer resistance enough to the propeller to enable it to force an aeroplane weighing from 500 lbs. and upward through the air, by a threading or screw thrust.

It is obvious that the small amount of air space left undisturbed offers little resisting medium to the propeller and that being so attenuated it is analogous to a stripped metallic thread. The density of a metallic body offers sufficient resistance to compel the tool to travel its pitch distance thus forming a useful thread or screw, while such an elastic medium as air when attenuated as shown cannot compel a propeller to follow its pitch lines, and the screw theory is not therefore tenable.

But a propeller having angular formation of blade surfaces does form a dynamic air structure which may be developed in theory and directly compared with practice.

by reason of the propeller forces and then provide means for directing the whole over a given course.

In Fig. 2 is shown a sectional view of such a mechanically created cyclonic air cone. The propeller is traveling in the direction of the large arrow. In its forward movement it is drawing in or absorbing air from the area before it and at its periphery, and, having condensed such air it expels it in the form of a cone. Now, in absorbing the air from the area about its periphery, a partial vacuum is created and the air loss is immediately replaced by new air through atmospheric pressure, shown by the vertical lines with curved ends, thus creating a substantially right angled opposing force to the air cone and offers an abutment of great value. The force of the cone current being greater than this opposing force, finally overcomes it, and absorbs it thus

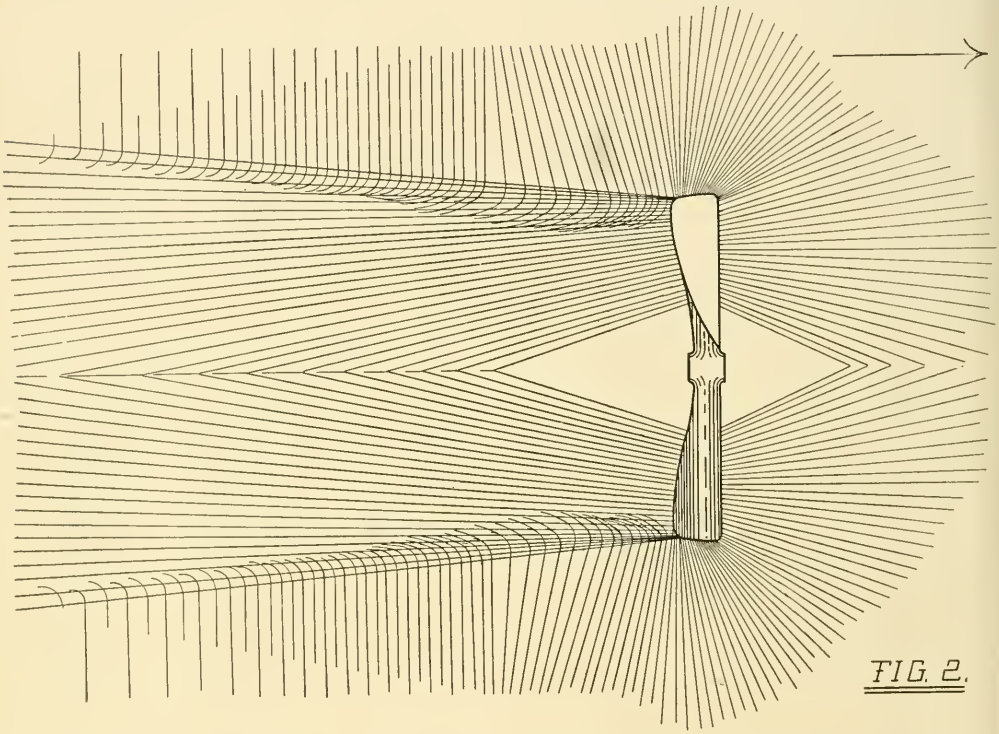


FIG. 2.

The action of a propeller on the air is analogous to an auger bit entering wood, in that it cuts into the medium, displaces it by its angular formation and gives direction to the displaced medium. In the case of the propeller, the displaced medium (air) is caused to impinge substantially inert air with resultant reactionary propulsion and thus perform useful work, while the auger bit displaces the medium (wood), in the form of chips which represent the useful work. Good design of the tool in either case is essential.

The efficiency of a propeller is due to its ability to grip the air, condense it, form it into an air cone and give to it volume, weight and velocity, the sum of these being a mechanically created, cyclonic force, which projected against substantially inert air propels the aeroplane at the necessary speed to exert elevating and sustaining power.

Smoke and vapor experiments tend to prove that a propeller draws or absorbs air from a space around it substantially as shown in Fig. 2. This air is condensed and takes the form of a truncated cone with a slightly rotating movement and is really a modified cyclone as the action and effect are almost identical. A natural cyclone takes the form of a rapidly moving, swirling, cone shaped air current and has sufficient dynamic force to disturb or set in motion bodies of greater weight than itself, and, substituting the aeroplane for such a body we may set it in motion by mechanically creating a cyclone

adding to the density of the air cone and increasing its efficiency when it impinges the substantially inert air.

Such a cyclonic air cone must not be interfered with in performing its function or its efficiency will be affected. This may be demonstrated by the fact that (as many aviators state), it requires more power or thrust to get an aeroplane off the ground than to sustain it when once in the air and the reason is that when an aeroplane is at a reasonable height the cyclonic air cone is free from surface interference while when it is on the ground the lower portion of the cone strikes the surface and the forces are diverted, partially destroying its cyclonic action and setting up negative conditions. It is also true that when two aeroplanes are traveling in close proximity, one above the other, there is great danger to the aeroplanes when their cyclonic air cones comes into contact with each other. This condition has been termed "propeller wash" and in several instances has resulted in fatalities.

The cyclonic air cone theory may be demonstrated with reasonable accuracy if we take known conditions of aeroplane travel and compare them with known data of air currents (wind) and such data may be found in the admirable lecture on air currents and winds given before the Aeronautical Society by Mr. James Scarr, district forecaster of the New York Weather Bureau, and published in the society's Bulletin No. 1. This

of course is a secondary standard and is employed because of the apparent impossibility of securing a direct standard owing to propeller action not being visible, but it would seem to be safe in assuming that if we know the actual pressure of an air current traveling at a known speed, on a known area we have perhaps the best comparable standard or constant obtainable, because the two problems are so closely allied.

In the formation of the cyclonic air cone the area described by the rotating propeller will give a disc pressure of unvarying size and the area of this disc through its square feet supplies a true constant from which we may measure the propeller efficiency in pounds pressure. It is obvious that if a propeller exerts a thrust or pressure per square foot of its disc constant the effect is identical with the thrust or pressure of a wind current on a disc area of corresponding size.

For comparison let us assume an aeroplane traveling with a speed of 39 miles per hour driven by a propeller having a diameter of 7 ft. which gives a thrust of 240 lbs. These figures are averages which exist in aeroplanes now flying and will serve to exemplify the theory of cyclonic air cone propulsion.

Now the disc area of a 7-ft. rotating propeller is 38.485 sq. ft. and is giving a thrust of 240 lbs. Referring to known data of wind pressures we find that air currents having a speed of 39 miles per hour will exert 6.18 lbs. pressure per square foot. Taking an area of 38.485 sq. ft. the pressure exerted will be 237.84 lbs., which while not balancing exactly the thrust of the propeller giving 240 lbs. is near enough to indicate a very close relation between the two, the discrepancy being less than 1 per cent. (Pitch or angular conformation of the propeller blades is disregarded, it being assumed that the pitch of angle is properly designed for the motive power to which it is more closely related.)

Power or motor speed is necessary to rotate the propeller at the required speed for a given number of pounds thrust or pressure and the angular formation of the blades requires a nicety of design that so far has only been attained by cut and try method, there being no reliable data to assist, but the disc constant offers a starting point of great accuracy inasmuch as it is the real source of thrust. It is reasonable to assume therefore that when used in combination with known data even of a secondary standard, a careful, systematic application of deduction or cut and try method will result in increased efficiency until a true constant is found. The writer holds no brief for the cut and try method but believes it to be the short cut to practical perfection, and when all is said and done the world's inventions have been developed in this way.

FOREIGN HAPPENINGS

LONGEST 2-MAN CROSS-COUNTRY FLIGHT

ETAMPES, France, Nov. 26.—Lieut. Delage and Lieut. Maillols (Farman) flew 125¼ miles in 3 h. 11 min., from here, around Blois, dropping a letter, and return, without a stop. Competing for Weiller prize for French officers.

BUC, Nov. 27.—Aviator Laurens, with his wife as passenger in his R. E. P. made new passenger speed-records for distances up to 80 kil., and covering 79 kil. in the hour. A list of all records will be published in the next issue.

TWO KILLED IN ONE MACHINE

ROME, Dec. 3.—Engineer Cammarota, an Italian army officer, and his passenger, a private, were killed at the Centocelle military field in a Farman biplane.

GERMAN AVIATOR CARRIES FOUR PASSENGERS

JOHANNISTHAL, Germany, Dec. 7.—Aviator Brunsuber circled the field here twice to-day, carrying four passengers with him, in a Farman biplane.

Dec. 5.—Mdlle. Dutrieu (Farman) now holds the female record, having beaten the 53-minute flight recently made by Mdlle. Marvingt. She was up 1 hr. 9 min., officially, covering 60.8 kil. Mdlle. Jane Herven (Bleriot) is another woman holding pilot license, the fifth on record.

PAU, France, Dec. 9.—Legagneux (Bleriot) made a new world's altitude record of 10,499 feet.

PARIS, France, Dec. 10.—Capt. Bellenger, French army aviator, broke all speed records, flying from Vincennes, 100 miles, in 70 minutes, an average speed of 80.5 miles an hour. The flight was made at an altitude of 4,000 feet. This is, as yet, unofficial, and seems almost improbable.

FARMAN MAKES LONGEST FLIGHT

ETAMPES, France, Dec. 18.—Henry Farman, competing for the Michelin cup, made a remarkable flight of eight hours and thirteen minutes. Owing to a fierce north wind, however, his progress was slow, and he covered only 466 kilometres (287 miles against 465.7 kilometres made by Maurice Tabuteau on October 28, in a similar competition.

Farman deceived by the applause of the spectators, believed that he had beaten the distance record, and descended. He was greatly disappointed to find that he had not equalled the former record.

DOVER, England, Dec. 18.—C. G. White, who won the International race at Belmont, wrecked his machine in a trial flight for the Baron de Forest $20,000 prize for the longest flight across the Channel in 1910, by an Englishman, in an English-built machine.

A second competitor for the prize, Thomas Sopwith, fared better than White. He left Eastchurch, Sheppey Island, at 8:15 o'clock in the morning, crossed from Dover to Calais and descended at Beaumont, Belgium. He used a Howard Wright biplane.

Sopwith completed his flight of 171 miles just under three and one-half hours. This is the first time that a British made aeroplane has crossed the Channel, and, in addition, it is a record flight for distance under the conditions provided.

On November 26 he made the best distance yet for the British Michelin $2,500 prize, 107¾ miles, time up 3h. 12 min., the English duration record.

The Farman biplane purchased by the British War Office, has successfully passed the tests imposed. The second British army machine, a Paulhan, also made successful flights.

The Austrian government has decided to order 3 Austrian-built machines. They will be required to fly 2 hours at an average speed of 44 m.p.h., and be capable of being taken down and packed on a motor-wagon within 1 hour, and re-erected in less than 2 hours.

In the course of a lecture in Paris the other day M. Soreau said that taking all countries the number of licensed pilots was about 500; the A. C. of France alone has issued 271 certificates, and the percentage of persons killed while engaged in flying was only six. M. Soreau pointed out that in order to estimate the risks the distances covered must be taken into account, and taking the reasonable aggregate of 125,000 miles for all the aeroplanes in the world, it worked out to one fatal accident for 4,375 miles.. This figure included accidents with experimental machines.—"Flight."

The French Aerotechnical Institute at St. Cyr, founded by Henry Deutsch, which he has endowed with $100,000, is finished. The site covers an area of 73,000 square yards with level ground on all sides.

In fitting a Gnome engine to a Bleriot XI, but little change is made. It is simply an enlargement of the head end to take the spider which holds the engine. The engine shaft is set at the same angle. In the passenger carrying Bleriots, with the fan tails, the engine shaft is tilted slightly downward. In this case there is an extra framework out beyond the usual head of the machine, which incloses the motor. When machines are set up again after coming from the factory there is the balancing to be done. Oftentimes it is necessary to remove the tail wheel and substitute a curved skid to lighten the rear end. It will be noticed that some Bleriots, in pictures, fly with the elevator at a slight angle to keep the tail up.

To those who seem to think an aeronautic magazine is an hitherto undiscovered gold mine, it may be of interest to learn from a letter of Mr. O. Chanute's that Nadar, a famous Frenchman who recently died, started an aero publication and issued 100,000 copies, obtaining 43 paying subscribers. This was "going some." Some other and more recent aero publications have done almost as well.

EXPERIMENTS WITH AEROPLANE WIRELESS

By Harry M. Horton.

Harry M. Horton

IN equipping an aeroplane with wireless apparatus one is immediately confronted by the problem of constructing a light, yet powerful transmitter and of so arranging the circuits that the vibrations of this miniature apparatus may be of sufficient strength to be of service. The entire "Aviation" set weighs but thirty pounds, and consists of: First, the power plant, a small compact storage battery that has an actual ampere hour capacity of sixty and a voltage of six; a high frequency coil that weighs but 12 pounds; a helix with two small condenser tubes mounted in parallel and the transmitting key.

In our first trial at Sheepshead, the key was mounted upon the steering wheel in such manner that Mr. McCurdy did not have to move his hand from the wheel in order to transmit a message. The instruments were connected in such manner as is best known to those practiced in the wireless art, but much to our chagrin and disappointment we received no intelligence from our "air" station whatever. After using many different forms of "hook ups" it occurred to us that the wire guys or stays were preventing the transmitter from oscillating truly; so in our next attempt we tried using the machine itself, disconnecting the one side of the main circuit and connecting the stays instead and in letting the other side fall below the machine. Success was immediate. Although this arrangement was successful from a wireless standpoint, we were brought up standing on account of the aviator receiving severe shocks each time the transmitter was operated if, by chance, he came in contact with any metal parts of the machine. A way was finally worked out, however, to make all of the stays on the machine, the engine, tanks, in fact all metal parts, act as part of the oscillating system. The aviator's levers being connected thereto and uninsulated, and being firmly grasped in his hands, the oscillations were actually passing through his body each time the transmitter was operated, but inasmuch as the other side of the oscillating system was carefully insulated, he experienced no ill effects.

During our Hammondsport series of experiments we used three tiny steel cables, heavily galvanized, fastened to the top of the shed and fastened outward by small liner guys. The height is about 30 ft., though each wire on account of its horizontal "V" shape was 60 ft. in length.

Our new receiver, especially constructed by the Wireless Specialties Company of New York, consists of a very small loose couple, a set of head telephones and the "Pericon," all nested in such manner that the entire set is but 4 x 4 in. and weighs but three pounds. In testing the new receiver the first morning it arrived, we were not a little pleased in being able to pick up Buffalo station, 142 miles distant, and with high mountains surrounding us on all sides.

The only change we made in our transmitter, from that used at Sheepshead, was a new helix giving us a greater range and a longer steel cable similar to the one described for receiving was tripped or thrown overboard after the machine took the air.

We have been "playing" in Hammondsport that we were working in war times, and that we were actually out in the field confronted by hostile forces. Our receiving wires have been kept at such height as is easily thrown up by the use of small masts, such as our Signal Corps are now using for their portable sets. The aeroplane shed is "headquarters," and the biplane is sent out from there to make observations of the enemy's fortifications and report the while.

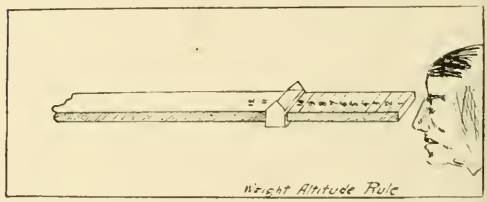
So far our tests have been successful beyond our own expectations, clear and loud signals coming in from the "air" station no matter where she has gone, and because of the strength of the signals that have been received from our air station over the distances which we have now tried, we are led to believe that a proper war machine with the wireless apparatus built therein as an integral part will be able to transmit to and receive intelligences from headquarter stations any distance the aeroplane scout would be liable to be sent in times of war.

The writer wishes to thank Mr. Curtiss, who gave us one of his newest biplanes for these experiments. Much praise is due Mr. J. A. D. McCurdy, who made many hazardous and difficult flights under the most adverse conditions, solely in the furtherance of this new phase of the wireless art.

Wright Altitude Rule

Along with the aeroplane "level" designed, but unpatented by the Wright brothers, is the yard-stick altitude rule. This is not exactly accurate, but close enough for general purposes for fair altitudes.

An ordinary yard-stick is taken and on it is attached a slide having two pointers, the latter set just an inch apart. The end of the rule is placed to the eye when the machine is directly overhead, and the slide moved up or down until the wings can be sighted just within the two points. The planes are, approximately, 40 feet wide, and if one



Wright Altitude Rule

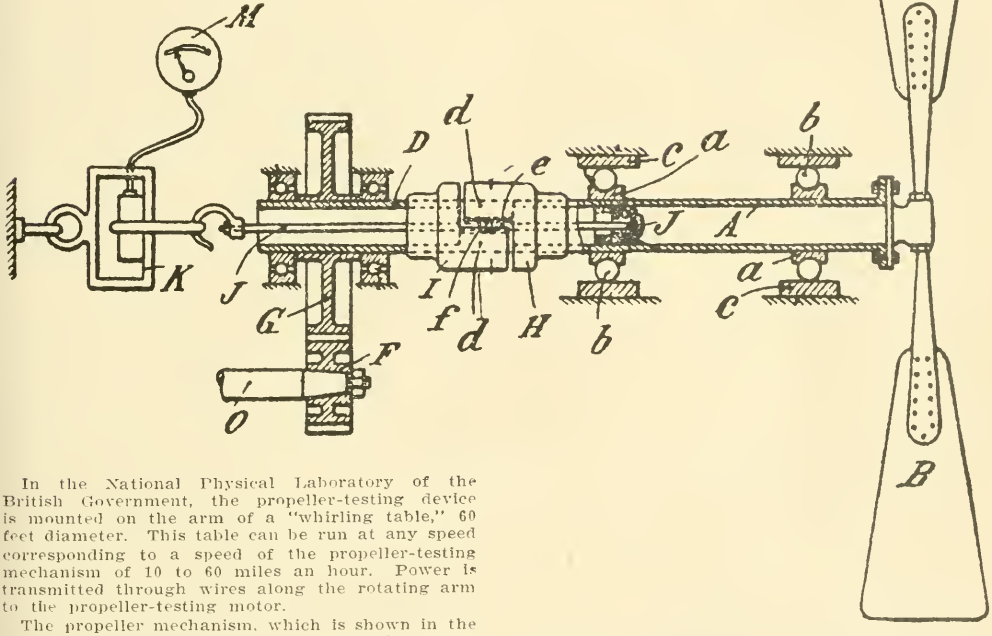
multiplies this constant by the number of inches the pointer is away from the eye, it will give the altitude in feet. The accuracy of the measurement depends entirely upon sighting properly and having the machine directly over head. For very high altitudes, the slide is also used with the pointers a half-inch apart, instead of 1 inch, in which case one multiplies by 80 in measuring a Wright machine.

MEASURING PROPELLER THRUST

A DEVICE for measuring the thrust of a screw propeller has been designed and patented by A. Clement.

In this, the measuring instrument is connected with the propeller shaft by means of a rod arranged inside the driving shaft and the propeller shaft. The shaft **A** of the propeller **B** is hollow and rotates in ball-bearings constituted by a grooved inner ring **a** and an outer ring **c** which is plane so that the balls **b** do not resist movement in a direction parallel with the shaft **A**. The shaft **A** is connected to a hollow shaft **D** driven from the driving shaft **O** by pinion **F** and gear-wheel **G**. The connection between the shafts **A** and **D** is by means of the two sleeves **H**, keyed on the shaft **A**, and **I** keyed on the shaft **D**, which sleeves are provided with a number of arms **d** between which, in longitudinal grooves **e**, are interposed balls **f** which transmit the motor couple, but are unable to retain the shaft in the longitudinal direction. The rod **J**, extending through the shafts **D** and **A**, rests at one end in a ball-bearing secured to the shaft **A** and at the other is attached to the liquid dynamometer **K** communicating with a pressure gauge **M**.

In America, the simple method is to tie the aeroplane to a tree or post with a "spring balance," introduced between the machine and the post, reading direct in pounds.



In the National Physical Laboratory of the British Government, the propeller-testing device is mounted on the arm of a "whirling table," 60 feet diameter. This table can be run at any speed corresponding to a speed of the propeller-testing mechanism of 10 to 60 miles an hour. Power is transmitted through wires along the rotating arm to the propeller-testing motor.

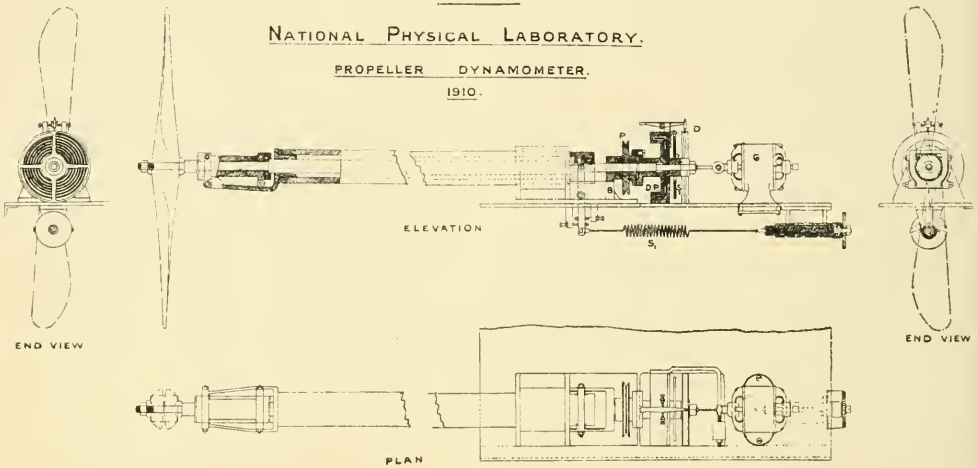
The propeller mechanism, which is shown in the second illustration, is designed so that the torque on the propeller shaft, due to a given thrust, is recorded on a drum. For this purpose the ball bearings which carry the propeller shaft are supported by a link motion which allows a small horizontal movement of the shaft, the motion of which is controlled by the spring S_1. The pulley P which drives the shaft is mounted on the bracket B, and transmits motion to the shaft through the outer easing of the oil dashpot D P, and the coiled spring S_2. On the circumference of the dashpot casing is mounted a small lever, at the extremity of which is fixed a pencil which is in contact with the paper on the drum fixed to the propeller shaft. The extremity of the propeller shaft is fitted to the armature of a small generator G, so that the speed of rotation can be deduced from the indications of a voltmeter on the observing table. In an actual test the tension of the spring S_1 is set to a given value, and the speed of the whirling maintained constant. The speed of rotation of the propeller shaft is then gradually increased by the regulator at the observing table until the thrust of the propeller is sufficient to balance the pull of the spring. When this condition is reached, the propeller shaft moves back on the link motion through a small distance, which is recorded by an axial movement of the pencil on the drum. On removing the paper from the drum, the circumferential motion of the pencil is measured, and the torque corresponding to the given thrust deduced. For convenience in showing when the desired thrust has been reached, the lever of the link motion is provided with stops, which, by making the necessary contacts, light a red or green lamp mounted on the whirling table.

IN view of the absence of precise data regarding the efficiency of various propellers for airships and aeroplanes, it is gratifying to learn that the Vickers Company have erected at their works at Barrow-in-Furness (England), a special apparatus for making practical tests of such propellers. The well-known attitude of the firm towards experimental research gives every reason for expecting that the experiments will be interesting in their scientific aspect, and profitable from a national standpoint, since they will afford data of importance in connection with the design of such airships as the firm build for the British Navy. It is further important to note that with characteristic solicitude for the advancement of science generally, Messrs. Vickers will place the apparatus at the disposal of investigators, so that any type of propellers may be tested. Briefly

stated, the apparatus consists of a double cantilever, 166 ft. in length from end to end, the longer arm of the cantilever being 110 ft. The cantilever is mounted at the center on a ball-bearing in a cast-iron column, and the propeller, which is fitted at one end and driven from a 100 h. p. electric motor, revolves the cantilever arm at any predetermined speed, ranging up to 70 miles an hour at the outer extremity. In the center of the arm there is a recording station, where all the results are carefully recorded, and the efficiency of any given type of propeller accurately deduced.

The cantilever is of steel construction, accurately balanced and suspended in such a manner that there is the minimum of friction or vibration. The point to which the suspension-rods converge is a steel bracket, to which is fastened a steel tube constructed of rolled-steel plates, butt-jointed and riveted. At the head of this tube is a ball bearing which supports the entire weight of the moving portion of the structure, a guide for the bottom end being supplied by four horizontal rollers carried on cast-iron brackets bolted to the lower end of the steel tube, and rolling on a turned belt on the column. The cantilever arm is mechanically recorded in the observation station. It has been found from experience that the thrust can be accurately measured to within one per cent of a total thrust of 500 pounds. The gear is made reversible, so that the efficiency of the propellers can be tested for going astern.

Provision has also been made for attaching a gondola to the platform ahead of the propeller, so that the results obtained from the machine may be relied upon as being exactly similar to those which will prevail when the propeller is placed on an airship astern of the gondola. By this means the exact position in the ship is closely imitated.—*Engineering*, London.



Safety in Aeroplanes

To the Editor:—

So many aviators are meeting death or serious injury by falls in aeroplanes that I venture to suggest this possible remedy: Let the aviator always sit on top of the biplane or monoplane, so that in case of accident no part of the machine will fall on top of him, but rather act as a cushion is itself built up of steel angles, and at the center there is a covered-in observation station which contains the 100 h. p. motor as well as the recording instruments. At the extreme end of the longer arm, 110 ft., from the center, there is a steel platform carrying a bracket and bevel-gear for driving the propeller, the power being transmitted from the motor to this gear to a line of shafting. The opposite end of the arm has a sheet-iron ballast tank at a radius of 56 ft, by means of which it is possible to accurately balance the whole structure.

All the conditions are exactly similar to those of a ship running in a straight line through the air, there being, we are informed, a method of compensating for the circular motion of the propeller, so that the proportion of the propeller blade nearest the pivot or center column is prevented from traveling less rapidly than the outer portion. The propelling power is arranged so that the revolutions of the propeller may be carried from 500 to over 1,000 revolutions per minute, and the speed of the propeller through the air can be regulated by means of resistance screens to conform to the conditions for which it may have been designed, which speed may reach, if necessary, 70 miles per hour.

It will be recognized that as the propeller traverses a circular course, the wind and other causes of resistance counterbalance each other. A system of accurately measuring the thrust of the propeller is included in the design of the bracket and gear, the propeller shaft being allowed to move forward against a spring, a movement which to help break his fall, and so that he will not become entangled in the wreckage and drowned when the machine "lands" on the water. By placing the engine and other weight a little lower the effect of the aviator being on top of the machine would be easily counteracted. Then I would arrange a parachute somewhat like a folded umbrella, only larger and with the hole in the center required to keep the device from swaying, with a pole extending up a few feet above the aviator's head, being attached to a brace under his shoulders, and the bare framework consisting of a hexagonal frame with braces, all extending around the pole above his head; the fabric to be in eight V-shaped strips, say of silk, wrapped around or rolled up inside the hexagonal sections of the frame tubing, the whole being arranged to open—or, rather, close up instantly with springs drawing the fabric from the rolls at the rim to the hole in the center, where there would be a very small rim, and the pressing of a button by the aviator being sufficient to release every spring at once instantly. This parachute would break the fall, and except for the slight danger of becoming entangled in his aeroplane, it would generally save the aviator's life, even though the machine were smashed, which would occur anyway. A parachute could also doubtless be made dirigible, and the aeronaut Nadal claimed that it is possible to steer a parachute by pulling down the cords on the side in the direction it is desired to go.

Livermore, Cal. ELMER G. STILL.

24-HOUR NON-STOP AERO ENGINE RUN

THE recent 24-hour run of an English aeroplane engine, under rigid rules, in competition tor the Alexander prize, ought to be a great inspiration to American engine builders.

Not a single American aeroplane engine concern has ever had a test made by any official body in competition. The Automobile Club of America, some time ago, announced a thousand dollar prize and, we are informed now, that three entries have been received, but whether or not from aero engine makers we do not know.

A duplication of this 24-hour run in America would be of the utmost value to aeroplane builders and users as well as to the makers of engines, whether winners in the competition or not. **Aeronautics** would like to see a series of competitions of this kind; or, if not competitions, similar tests of the various engines made in this country.

A most complete set of rules and conditions were devised by the committee in charge of this test and a synopsis was printed in American **Aeronautics** of February, 1910. The full text was published in British "Aeronautics" of January, 1910.

AWARD IN ALEXANDER MOTOR COMPETITION

The prize in the Alexander motor competition, in England, as the tests were not complied with, was not awarded, but Mr. P. Y. Alexander, the donor, gave the Green engine concern $500, as a prize for the engine's good showing, and the Aerial League is giving a silver medal. The rules were drawn up by the English governmental body, "Advisory Committee for Aeronautics," in conjunction with the Aerial League and Mr. Alexander, whose financial aid in behalf of the art has been extended in America as well as England, her colonies and other countries.

Six engines originally entered, but only three were delivered by the date named—October 18-19—the Wolseley, Humber and Green. Two of the engines failed to complete the 24-hours' run, and were not subjected to the further tests. The third engine, the Green, maintained a mean power of 31.5 h.p. Further tests were made with this engine. The tests of this engine, when tilted, were made at 18 h.p., instead of at full load.

DESCRIPTION OF ENGINE

General.—This engine has four separately mounted cast-steel cylinders, machined inside and out, of 105mm. bore, with a stroke of 120 mm. The water jacket consists of a thin copper helmet, the joint with the cylinder at its lowest end being by a rubber ring fitting into a groove in the cylinder, so that the expansions of cylinder and helmet are independent. The cylinders are mounted on an aluminum crank case, the holding-down bolts being carried through to serve as supports for the crank-shaft bearings.

Valves.—The valves are of the mushroom spring closed type, in detachable cases. Each valve is enclosed within a small dome, having an orifice through which the valve is actuated by the end of a short tappet pin.

The cam shaft is carried in bearings in a small oil-tight horizontal casing, divided into halves, and is rotated by an encased vertical spindle situated in front of the engine. This spindle is driven by a pair of worm-wheels from the crank-shaft. The rocking levers are pivoted in extensions of the cam-shaft case, their striking ends being provided with adjusting screws, and the ends operated by the cams with rollers.

Carburetor.—This has no float chamber, and its action is independent of the inclination of the engine. It is of the single jet type, and has automatic air control.

Ignition.—High tension magneto.

Cooling.—The engine is water cooled, circulation by gear pump.

Lubrication.—Main oil channel is cast solid with the crank case and, from this, oil is forced by a small gear pump through leads at right angles communicating directly with each of the hollow columns through which the holding-down bolts pass, and thence to the main bearings and crank shaft, the latter being hollow. By this system, the use of separate pins is dispensed with.

Bearings.—Crank shaft is provided with bearings between each throw, and is slightly offset from the center line of the cylinders. The ball-race is designed to be used with either a propeller or a tractor.

Weight of engine alone, 219 pounds.

RESULTS OF TRIALS

After an hour's run, with ignition trouble, the test was actually started, and continued making approximately 31.5 b.h.p., at 1,213 r.p.m. The only attention to the engine during this period was the addition of 42 pints of oil, 17 hours after the commencement of the trial, and an additional 21 pints 22 hours after commencement.

In other tests, the maximum h.p. which could be maintained for 7 minutes was determined after the completion of the 24-hour run, without any overhauling, except grinding the valves. The h.p. obtained was 36.4 at 1,390 r.p.m.

To test the effect of the gyroscopic action of the propeller, a couple of 50 foot-pounds in a vertical plane were applied to the motor shaft for three minutes, while the engine was running, but no effect on the speed and torque could be detected.

To determine whether the engine would work satisfactorily when tilted about an axis transverse to the shaft, two runs of an hour each were made on the engine when tilted at an angle of 15 degrees, first one end, and then the other end, being uppermost. The competitors did not wish to run their engines at full load during this test, and maintained the b.h.p. at approximately 18 throughout both trials. The engine ran steadily in both cases, but it was noticed that the exhaust was decidedly smoky, apparently indicating over-lubrication.

The general steadiness and freedom from vibration of the engine when running, were so marked that it was not considered necessary to test it when running and placed on elastic supports.

On the completion of the trials, the engine was dismantled, and the working parts thoroughly examined. Very little wear could be detected in the crank shaft and connecting-rod bearings, and the state of the cylinders and valves appeared to be quite satisfactory. The ball races of the thrust bearing at the propeller end of the crank shaft were, however, considerably worn. In the crank-shaft bearings one of the aluminum caps was cracked right through for about one-third of its length. It was not certain that this crack had originated during the National Physical Laboratory tests, as there was some evidence that it existed before these trials began, but it appeared probable that the crack had become larger during the tests. In the case of one of the connecting rods, it was found that the sleeve inside the small end of the rod had rotated, so that the oil-way to the pin was blocked up and, further, the gudgeon pin had moved sideways and was rubbing against the sides of the cylinder.

The Green engine made a gross run of 24 hours, stopping once for 10 minutes, making net run of 23 hours 50 minutes. Weight of engine alone, 219 pounds. Moment of inertia of flywheel in foot-pound units, 0.26. Mean speed, 1,212 r.p.m. Mean b.h.p., 31.5. Water carried, 38 pounds. Water evaporated, 3 pounds. Gasoline per b.h.p. per hour, 0.503 pounds. Oil per b.h.p. per hour 0.282 pounds. Gross weight engine with oil, fuel, cooling water and containing vessels for a 6-hour run, 431.6 pounds. Weight of engine alone per mean b.h.p., 6.96 pounds. Gross weight per b.h.p. for 6-hour run, 13.71 pounds. The highest b.h.p. reading was 37.1 h.p. at 1,470 r.p.m. In the test of the engine with moment of 50 foot-pounds applied to crank shaft in a vertical place to represent gyroscopic action of the propeller in steering, lasting 3 minutes, no apparent effect on speed or torque was recorded.

No starting devices were supplied to any of the engines, so that for the purpose of starting the dynamo was connected to the Laboratory mains and used as a motor. No difficulty was experienced in starting.

The Wolseley engines made net runs of 3 hours 2 minutes, and 15 hours 23 minutes, respectively, maintaining mean speeds of 1,445 and 1,420, delivering mean b.h.p 36.2 and 34.8. Total weight of power plant, 453.2 and 457.2 pounds. Neither Wolseley nor Humber took part in the special tests.

The Humber made a net run of 11½ hours, maintained mean speed of 1,230 r.p.m., delivering mean b.h.p. 37.8, total weight power plant, 472.9 pounds. This engine is a 4 cylinder, water cooled, cast-iron cylinders, 110 mm. by 120 mm. The Wolseley has 4 cast-iron cylinders 95 mm. by 140 mm., water cooled.

AERONAUTICS AND WAR

By Lieut.-Col. W. A. Glassford.

SIGNAL CORPS, U. S. ARMY.

(*Continued from the December number*)

It may be observed that the spherical balloon still remains, in spite of all recent progress in aeronautics, the most appropriate machine for reaching high altitudes in the atmosphere, and furthermore, there are as yet no indications of any developments in this line which will enable us to replace the spherical balloon for this purpose. The spherical balloon, so far as we are able to judge at present, will keep its place undisturbed in aerial navigation. It is already capable of rising to heights far beyond that in which man can live, even with the aid of oxygen carried along in a sack for the purpose of supplementing respiration.

Although the spherical balloon is capable of reaching great altitudes, its movements can be governed only in a vertical direction. It was early sought to remedy this limitation in the control of the movements of the balloon. In order to accomplish this, balloons were provided with sails and with screw propellers, even with oars. The shape of the gas bag was changed from a spherical one to the elongated variety which we now see used in the dirigible balloon. Mechanical motive power of a kind available for this purpose, however, was absolutely wanting in that epoch. It was only possible to turn the propellers by hand; and, as this did not furnish sufficient power, one ingenious inventor proposed to bring down electricity from the upper stratum of the atmosphere by means of a wire attached to a smaller balloon, and through this electricity he proposed to derive in some way the power necessary to turn his propellers. Many were result. The invention of the steam engine did not bring the solution of the question, principally on account of the great weight of the boiler. Nevertheless with improvements in this mechanism and with a special construction for the purpose, we find Giffard in 1852 attempting to direct an elongated balloon by means of a propeller worked by a 3 h. p. steam engine, using coke as a fuel. On the advent of the gas engine, we find attempts to use it as a motive power, deriving the gas used as a fuel from the balloon itself. But the earlier forms of the explosion engine were developed on the principle of having capacious cylinders with pistons connected directly to the driving shaft. Such a system requires great weight for a given horse power and the experiment did not prove a success. The development of the dynamo immediately suggested its use as a motive power in the direction of balloons. But in this new engine as in the preceding, we find the apparatus encumbered with too much weight, as it was necessary to carry with it a very heavy storage battery. In spite of this, some encouraging work was accomplished by its use; balloons were directed by this means to a limited extent in calm weather in short voyages.

We now come to the most recent accomplishments in the endeavor to solve the great question of control over the horizontal movements of balloons. Recent advances in this direction are due to the development of the light explosion motor used in the automobile. This more modern explosion engine differs from the gas engine, its predecessor, in the very important particular so necessary for balloon work; that is, in its being many times lighter for a given horse power than its predecessors. This engine is constructed with small cylinders and works at great speed, which speed is geared down before the power is transmitted to the driving shaft. Its mode of action would be more or less aptly illustrated by conceiving the motive power to start at the spindle of a spinning wheel and working in the opposite direction, transmitting the power to the big wheel. Working in this way but little power is required for each turn of the spindle, but the sum total of the power in this case depends on the speed with which the spindle is turned. The speed is attained by small explosions rapidly succeeding each other. An engine working on this principle is very much lighter for a given horse power than any yet produced, and recent advances in the development of aeronautics have been directly due to this gain in power for a given weight of mechanism. Further advances in the development of the motor will certainly produce corresponding advances in the evolution of aeronautics.

One of the most important features of the dirigible balloon is its shape. It is constructed in an elongated form, pointed at the ends in order to diminish head resistance to the wind. Such a shape is obtained at the expense of buoyancy and of course has its limits. The elongation of the envelope is also limited by the difficulty of giving to such a shape proper rigidity. Dirigible balloons as they exist today may be divided into three types: the flexible, the semi-rigid and the rigid. The first is represented by the American "Baldwin," the semi-rigid by the French "La Patrie," and the rigid by the German, Zeppelin. The stiffening of the envelope in the "La Patrie" type of balloon is obtained by means of a horizontal framework covered with canvas and suspended immediately under the balloon. In the Zeppelin type we have a cylindrical framework, pointed at the ends and divided into compartments throughout its entire length and covered with canvas. Within the compartments of this framework are housed a number of spherical balloons. Balloons of the Baldwin type must necessarily be small; those of the French semi-rigid type can be made much larger, and those of the Zeppelin type can

assume very large dimensions, and are capable of developing great carrying capacity. Each of these types has its own particular advantages. The small non-rigid type can be transported and housed with facility, and can make landings with greater ease than the larger types, but cannot, so far, make long voyages. This type and the semi-rigid have the disadvantage of being composed of a single gas bag, which, if injured, incapacitates the balloon immediately. In the Zeppelin type we have as many as 17 separate balloons and an injury to one or two of these does not necessarily incapacitate the airship, but such a combination requires a length of more than 400 feet, and this great length makes landings much more difficult than in the case of the single gas bag variety. Moreover, the Zeppelin type cannot well be dismantled and packed. All these air craft are more or less troublesome to anchor on the ground, even in a moderate wind, and the longer they are the more the difficulty.

As to the speed attained by the dirigible balloons, through their own efforts, this has not yet been determined with precision. It will be noted that during a calm on the ground there is always air in motion at very little distance above it, so that what with being assisted or impeded, it is somewhat difficult to distinguish the speed of the balloon itself, or what this speed would be were the air entirely at rest. However, records made by dirigible balloons in traveling from place to place, either assisted or otherwise by the wind, are available in sufficient number in order to determine this question for practical purposes. The highest speeds actually attained range between 18 and 32 miles per hour. Much has been said in regard to the possible speed that may be attained in the future by this kind of air craft, but it should be noted that an increase of speed brings with it a growing increase of head resistance which will soon arrive at a point where considerable strengthening of the envelope would be required, and the additional weight of this would soon lead to a limit.

At the present speed of dirigible balloons such craft can generally be used only in some directions, as winds of 18 to 32 miles an hour are very frequent, especially high above the surface of the ground. There are also many days of the year on which balloons of this class would only be partially available.

Let us now consider for a moment the aeroplane or heavier than air flying machine. A characteristic of this mechanism, which it is very necessary to bear in mind, is the speed with which it is required to travel, in order to fly. It should be remarked that speed is not an essential element in the operation of balloons, whatever may be their form, while in the aeroplane, as at present developed, speed is an absolute necessity. In seeking for improvement in the dirigible balloon we endeavor to obtain greater speed, while improvement in the aeroplane may signify less speed. The success of the heavier than air flying machine, as in the case of the dirigible balloon, is due to the light explosion motor such as is used in the automobile.

The winged portion of this machine has been slowly evolved from the experiments of a number of men. Passing over legends, stories and suggestions, and also the experiments of Wenham in 1867 (which latter contained valuable information), we arrive at the work of Lilienthal, in 1889, who considered the subject of artificial flight in a thoroughly scientific manner, and who communicated data concerning his experiments, which have been of the greatest importance in the evolution of the aeroplane. Lilienthal practised gliding; starting from heights of about 100 ft., he was able to sail over a distance of 600 to 1,000 ft., and he became quite an expert in giving direction to his flights. He made innumerable experiments of this kind and was about to apply a light motor of his own construction to his aeroplane when the fatal accident, Aug. 9, 1896, put a stop to further experiment. While these experiments were going on, Professor Langley was likewise accumulating fundamental data which have also had their effect in the subsequent development of the heavier than air flying machine. At the same time Maxim in England built a flying machine at the cost of $100,000 which was provided with a steam engine of extraordinary lightness for the power developed, which flying machine on trial, rose from the ground with considerable force, but it lacked stability. This experiment was, nevertheless, of great utility, as it demonstrated the fact that even a steam motor could be made of sufficient power for the limited weight required in this kind of craft.

A short time previous to the death of Lilienthal, in 1896, Chanute began to make experiments in gliding with aeroplanes, of which he constructed six of five different types with which several thousand glides were made. In these experiments it was sought to so construct the planes that they might automatically have a perfect balance in the air, and also in directing them it was sought to produce the turning movement by means of a rear rudder instead of shifting of the weight of the man. Also the effect of superposing planes was especially studied. The result of these experiments was finally communicated to the public and the data concerning them were of much use to the subsequent experiments of the Wrights, who continued them along the same lines, but with improvements by flexing and increasing the size of the wings to about double those that had been previously used. In the meantime the light explosion motor was developing into a suitable engine for use in such an air craft; and after much practice in gliding, in which the Wrights became very skilful, they fitted a motor of this class on one of their machines and succeeded in flying with it, Dec. 17, 1903. The speed of the aeroplanes is now from 38 to 55 miles per hour, and approximately this speed must be maintained at all times while the machine is flying.

The question of directing balloons and of navigating aeroplanes as at present practiced

is one which depends upon the development of mechanical energy in great proportion to the weight of the material used in the mechanism to such a degree as we have no example of in history. But the development of energy in proportion to the weight of the engine employed has not yet progressed to a point which may be compared to that displayed by the bird. Of course, an engine of sufficient power is not all that will be needed. Many improvements in detail will no doubt be necessary before the power, once it is attained, may be applied for the purpose. But such is the scientific interest that has been awakened in the problem of aerial navigation that future progress in the development of the power and of better designs will be almost simultaneous.

The success of the heavier than air flying machine, and the greatly increased speed of the dirigible balloon, have awakened in the public mind widespread speculation as to the uses that may be made of these craft in war. The comparatively sudden attainment of what had been looked upon in all ages as impossible has produced exaggeration in the estimation of the importance of those developments as a source of military power. To begin with, it might as well be stated that as an offensive weapon of war, all air craft as they exist today may be eliminated from consideration. The most that has ever been claimed for them in this respect, by those competent in military affairs, has been the possibility of their scattering firebrands. As a means of reconnaissance and in sieges, air craft of all descriptions will, under some circumstances, be of use, but even for these purposes their power and usefulness has generally been very much exaggerated. The most conspicuous example in war in which balloons have been of service was in the siege of Paris. During this siege, which lasted about five months, many balloons were sent out bearing dispatches, private correspondence, newspapers, etc., and also carrier pigeons, which birds afterwards came back bearing news from the outside. By means of the balloons and carrier pigeons a postal connection with the outside world was regularly maintained throughout the entire duration of the siege. The principal benefit derived from these communications, however, was the encouragement which they gave to the population, which under the then existing political situation was of prime importance. The great revival of interest in aeronautics which has taken place since then has been largely due to the achievements of the balloons in that siege.

For the purpose of reconnaissance the balloon has always been more or less useful and will now become much more so, as the means for directing its horizontal movements are improved, and the same reasoning may be applied to the aeroplane. But the value of air craft for reconnaissance in war will depend upon the value of reconnaissance itself in any particular case. The general movements of forces in war, for the most part, are determined by fixed conditions which are quite well understood beforehand by the strategist of either side. It is only the movements of forces of minor importance that might escape observation of an opposing commander. Of course, these movements of minor importance in appearance might be indications of a movement in mass, but they could not proceed very far, in any event, without becoming known. Where a military situation presents an alternative the probabilities of a general movement in a particular direction will generally be indicated by considerations of a general character, which considerations would not be determined by information derived from a reconnaissance.

Air craft, then, may be of use in war as a means of reconnaissance and in sieges, but even were their uses confined solely to these and the encouragement which they might give to the population this alone would be of sufficient reason for their adoption by the army.

A discourse on the general subject of aeronautics would be incomplete without some consideration of the manner in which the general public views this question. We are now passing through an epoch of enthusiasm somewhat similar to that which followed the first balloon ascension in Paris in 1783. Speculation as to the growing capabilities in the near future of air craft seems to be running riot. Already we have them pictured as competing with the common carriers of the land and of the sea. This exaggerated enthusiasm is being made use of in Europe in order to stimulate a war spirit, thereby facilitating appropriations for military purposes. In our own country, however, exaggeration as to the future capabilities of the flying machine has proceeded to such an extent as to picture the possibility, through their great powers of destruction, of their doing away with war altogether, and instead of facilitating appropriations for defense it impedes them.

Present enthusiasm is certain to lead to reaction and loss of interest when the capabilities of the recent improvements in aeronautics become better understood. In dealing with a subject so complex and difficult as aeronautics, continued effort is necessary, and the men who may be detailed in the army to utilize air craft in war should have had a long previous training in this branch. How this can be obtained under our present organization is not very clear. What is really needed is an independent establishment, or school for aeronautics, in which officers may be trained not only in the manipulation of the air craft itself but also in the all important art of reading the landscape from an elevated position. Such an establishment should be organized with the object not only for the purpose of utilizing the present capabilities of air craft in war but also with a view towards extending them.

Natural Gas Ballooning.

Despite the assurance of "experts" that natural gas is unsuitable for balloons, H. E. Honeywell proved that it was very proper stuff indeed. An aero club was formed at Topeka, Kan., which bought a Honeywell balloon. E. S. Cole is president. A 40,000 cu. ft. balloon easily carries three people, and the expenses of shipping back, gas and everything does not run over $30, as the gas costs but 10 cents a thousand feet. The very first trip made was one of more than a hundred miles. If natural gas of such quality, even after being piped for two hundred miles, and containing more or less air, could be had in the East a balloon ascent might be made once in a while by some of the least inactive members of the indoor aero club.

WRIGHTS' IMPROVED ANEMOMETER

(Patents not applied for.)

By John W. Mitchell.

THIS is the story of a rag but there is no bone and hank of hair connected with it, but it is regarded as interesting, none the less, as throwing a side light on the Wrights and their way of doing business. Everyone who has closely examined the aeroplane that was at College Park probably noticed a rag that hung from the front rudder. It was hardly more than a strip of tape, a fraction of an inch wide, and might have been torn off the edge of a good-sized handkerchief. One of the visitors who was looking at the machine asked what the rag was for, and the correspondent who was asked replied: "Don't know. But knowing Wilbur as well as I do, I guess it has some reason."

That is perfectly true, and the rag plays quite an important part in managing the machine. It is nothing more nor less than an indicator as to whether the machine is going up or down, or whether she is keeping an even keel sidewise. Almost any one would think that with a thirty-thousand-dollar machine there would be some reasonably expensive delicate instrument for keeping track of the balance. But there is not, and as the rag serve the purpose well enough they let it stay.

Wilbur has been asked several times whether some apparatus in the way of a pendulum or a spirit level or something of the sort would not be useful on the machine, or whether something of that sort had not been tried. He replied indifferently "not so far as he knew," and at the same time the rag was hanging on the front rudder and was being used every day. That is about as far as Wilbur goes in disbursing information.

ORVILLE'S EXPLANATION.

When Orville was over at Fort Myer the same inquiry was made of him, and he replied at greater length, but not more enlighteningly, saying that a pendulum was more misleading than it was reliable, because after it had started swinging it kept on swinging and did not indicate the true direction of the aeroplane at all.

The rag, however, answers the purpose. If it points up the operator knows that the machine is going down, and if it points downward he knows that he is going up. If it flutters out straight behind the operator knows that all is going well and that she is keeping an even keel, but if it points to the side he knows that he is skidding, and the machine must be brought back to balance by the use of the wing tips. In fact, the soaked and grimy piece of rag is as effective a tell-tale as the most expensive instrument that could be designed.

There may be other features about the Wright machine quite as simple and effective as the rag on the rudder, but if there are they will never get out to the public through the Wrights' loquacity. But it shows how the Wright mind works and how the remarkable brothers take the shortest and simplest cut to whatever they are after.

ORVILLE'S QUICK CALCULATION.

The rag indicator is something in the same line as the story they tell about Orville and the expansion of the brass ring. There was a manufacturing concern in Dayton that wanted to know how much a brass ring they were making for some steam pipes would expand under the heat of the steam. They had a high-grade mathematician figuring on the problem for two days, and after he had obtained the answer Orville made the calculation in five minutes, using merely the circumference of the pipe and the coefficient of expansion of brass, both of which were perfectly well known. He told the story himself to explain how there was a short way and an involved way of making nearly all calculations

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For Coating Planes.

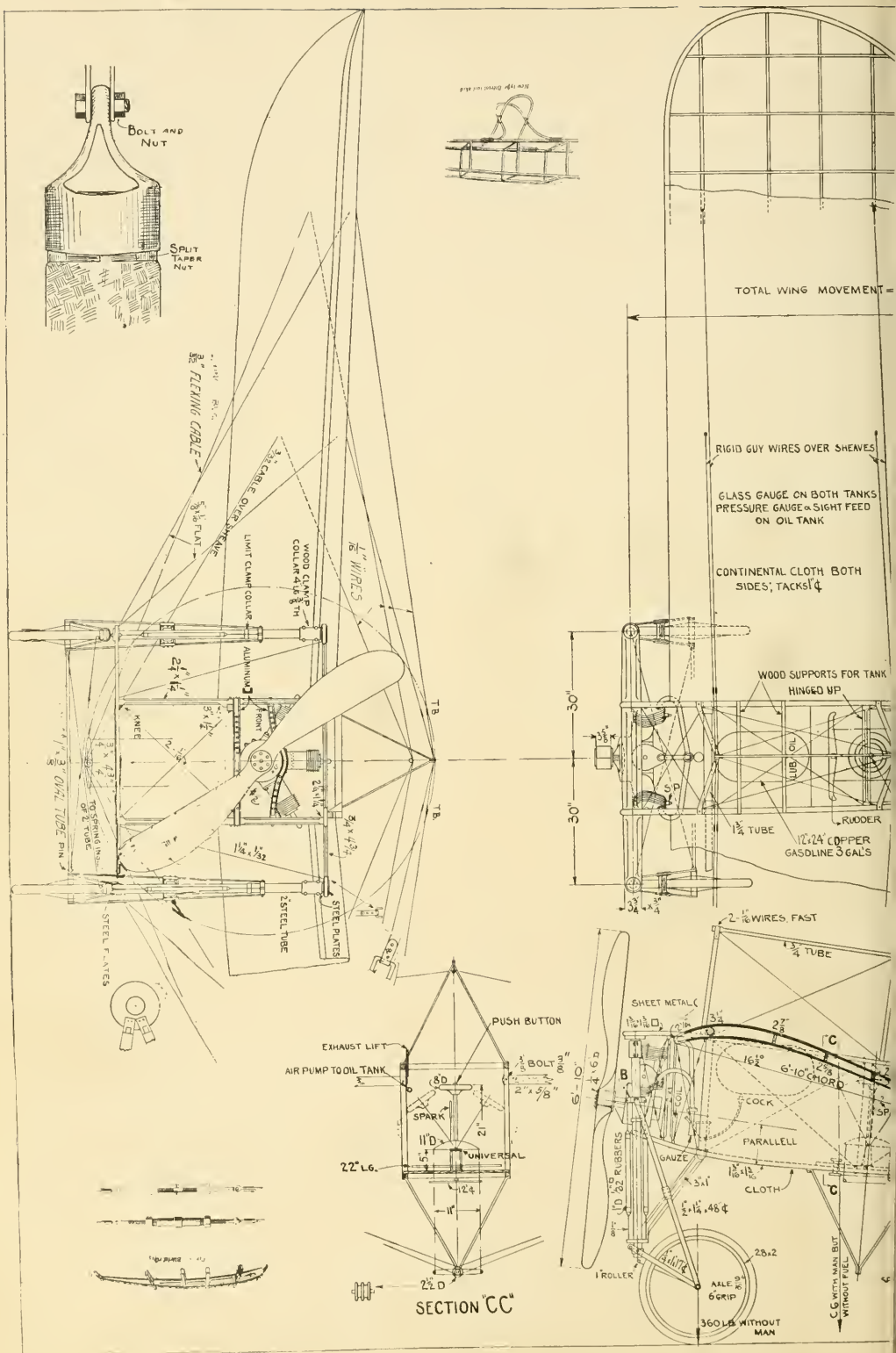
A preparation suitable for use on cotton fabric covering of planes may be made of fish glue, to which is added enough water while warming to form a thick soup. Then add enough alum solution to keep the glue from rotting. This preservative when applied to the cloth after it has been stretched on the plane will make it tight and give it a semi-glossy finish. If by reason of moisture, or rain, the cloth becomes sagged, another application can be made, bringing it back to original form. This solution is generally applied once a month when machines are having constant service.—*Aeromotion Co., St. Louis.*

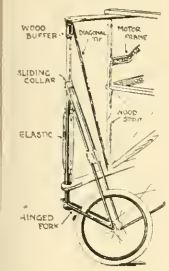
Horsepower Rating

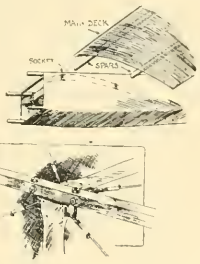
The formula used by the automobile department of New York State in licensing cars, known as the A. L. A. M. rating, being that adopted by the Association of Licensed Automobile Manufacturers, is as follows: The bore squared, times the number of cylinders, divided by 2½.

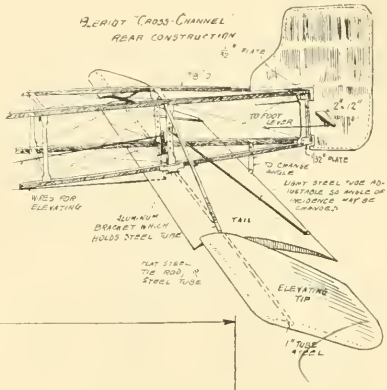
Another rating, which considers the stroke, is diameter squared, times number, times stroke, divided by 12. For 2-cycle engines the result should be multiplied by 1 5-8 or 1 3-4. The A. L. A. M. table follows:

Bore In.	Horsepower 2-Cyl.	4-Cyl.	6-Cyl.
2½	5.0	10.0	15.0
⅝	5.5	11.0	16.5
¾	6.0	12.1	18.1
⅞	6.6	13.2	19.8
3—	7.2	14.4	21.6
⅛	7.8	15.6	23.4
¼	8.4	16.9	25.3
⅜	9.1	18.2	27.3
3½	9.8	19.6	29.4
⅝	10.5	21.0	31.5
¾	11.2	22.5	33.7
⅞	12.0	24.0	36.0
4—	12.8	25.6	38.4
⅛	13.6	27.2	40.8
¼	14.4	28.9	43.3
⅜	15.3	30.6	45.9
4½	16.2	32.4	48.6
⅝	17.1	34.2	51.4
¾	18.0	36.1	54.2
⅞	19.0	38.0	57.0
5—	20.0	40.0	60.0
⅛	21.0	42.0	63.0
¼	22.0	44.1	66.1
⅜	23.1	46.2	69.3
5½	24.2	48.4	72.6
⅝	25.3	50.6	75.9
¾	26.4	52.9	79.3
⅞	27.6	55.2	82.8
6—	28.8	57.6	86.4

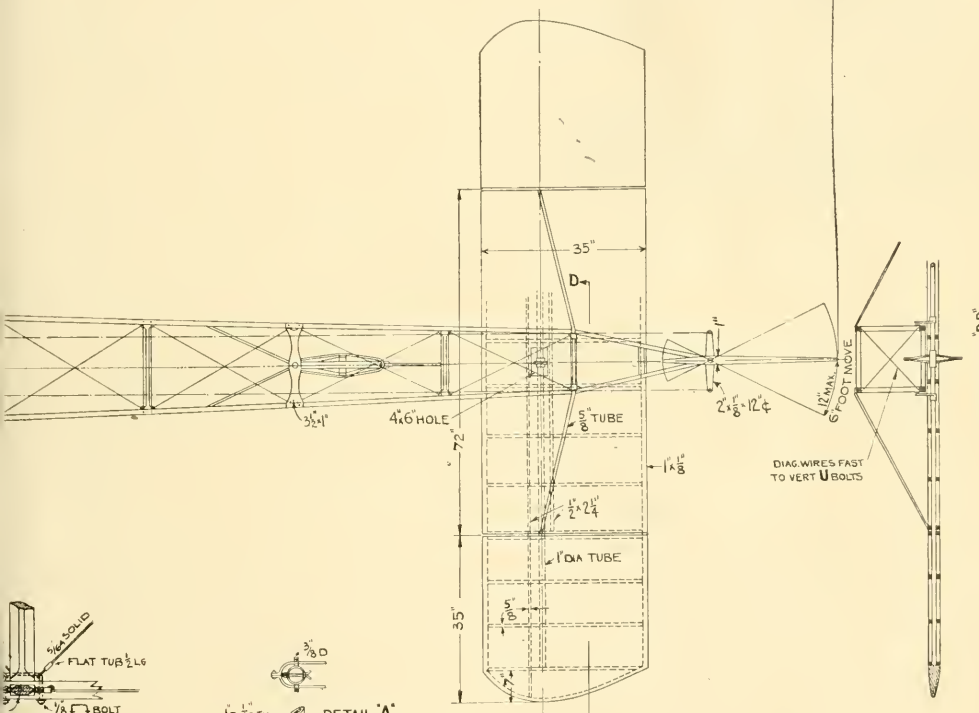

BOLT AND NUT
SPLIT TAPER NUT
TOTAL WING MOVEMENT
RIGID GUY WIRES OVER SHEAVES
GLASS GAUGE ON BOTH TANKS
PRESSURE GAUGE & SIGHT FEED ON OIL TANK
CONTINENTAL CLOTH BOTH SIDES, TACKS 1¢
WOOD SUPPORTS FOR TANK HINGED UP
FLYING CABLE
LIMIT CLAMP COLLAR
ALUMINUM
WOOD CLAMP COLLAR
WIRES
TB
STEEL TUBE
STEEL PLATES
OIL TUBE
TO SPRING ON OIL TUBE
KNEE
FRONT
30"
30"
LUB. OIL
RUDDER
1¼ TUBE
12"x24" COPPER GASOLINE 3 GAL'S
2-⅛ WIRES, FAST
¾ TUBE
SHEET METAL
PUSH BUTTON
EXHAUST LIFT
AIR PUMP TO OIL TANK
BOLT
SPARK
UNIVERSAL
22" LG.
SECTION "CC"
COCK
PARALLELL
GAUZE
CLOTH
RUBBERS
ROLLER
AXLE
6 GRIP
28x2
360 LB WITHOUT MAN
C.G. WITH MAN BUT WITHOUT FUEL


WOOD BUFFER
DIAGONAL TIE
MOTOR FRAME
SLIDING COLLAR
ELASTIC
WOOD STRIP
HINGED FORK


MAIN DECK
SOCKETS
SPARS

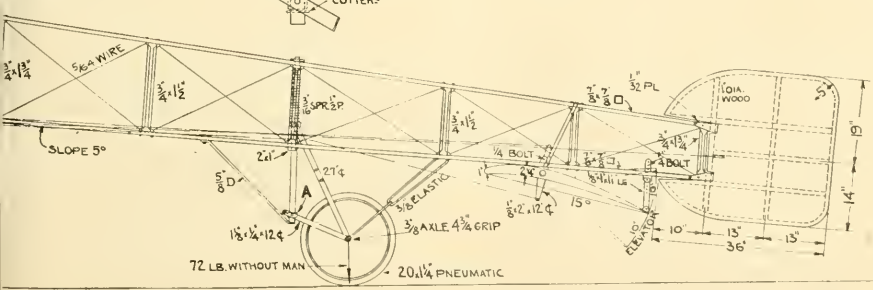

BLERIOT CROSS-CHANNEL REAR CONSTRUCTION
TO FOOT REST
WIRES FOR ELEVATING
ALUMINUM BRACKET WHICH HOLDS STEEL TUBE
TAIL
FLAT STEEL TIE ROD 1" STEEL TUBE
ELEVATING TIP
1" TUBE STEEL

24'-9"


35"
D
4"x6" HOLE
5/8" TUBE
1" DIA TUBE
35"
7"
DIAG. WIRES FAST TO VERT U BOLTS
6 FOOT NOVE
SECTION "DD"

5/16 SOLID
FLAT TUB 1/2 LG
7/8" BOLT
T DETAIL

3/8 D
10 1/32 TH
DETAIL "A"
COTTERS


SLOPE 5°
5/64 WIRE
5/8 D
A
5/8 ELASTIC
3/8 AXLE 4 3/4 GRIP
72 LB. WITHOUT MAN
20 1/4 PNEUMATIC
1/4 BOLT
5/8 TAIL LG
15°
10"
13"
36"
13"
19"
14"
10 DIA. WOOD
ELEVATOR

WINTER BALLOONING NEW SPORT

By A. Passenger

A BALLOON trip made from St. Louis on November 22, in the "Centennial," a balloon of 78,000 cubic feet capacity, stands as a record flight for number of passengers carried from this point with the use of a coal-water gas.

The six passengers who enjoyed this trip, laughed at the crowd of anxious spectators who tried to persuade them to forego their trip, owing to a break in the bottom of the basket, and rose at 11:15 a. m., from the Aero Club of St. Louis grounds, Chouteau and Newstead avenues.

Those in the party, besides Captain H. Eugene Honeywell, pilot and manager of the French-American Balloon Company, of St. Louis, were: J. Cowan Hulbert, sales manager of the Aero-motion Company of America, with offices in St. Louis; Marc Seguin, secretary and treasurer of the same company; O. L. Mote, of the Mineola Aero Supply Company; Max Dingfelder, of Detroit, and John Schwister, of Minneapolis. The total weight of the six passengers was 945 pounds, and the start was made with but 8½ bags of ballast.

The balloon rose from the **Club Grounds** at 11:15 a.m., under ideal conditions, and drifted n.w., striking an equilibrum at 1,300 feet. At 11:35 it had reached an altitude of 1,500 feet, drifting in approximately the same direction. At noon 1,900 feet had been reached, and we had sighted the Missouri River. At 12:20 we crossed the Missouri River about two miles west of the Burlington R.R. bridge at an altitude of 1,900 feet. At 12:45 the course had changed to due north and we crossed the Mississippi River at a point about eight miles north of Alton, Ill. Altitude 1,980 feet.

The weather was clear, as we had passed away from the smoke clouds of St. Louis, and a very enjoyable trip was made over the farm-lands of Illinois. This being the first balloon trip of several of the party, much amusement was afforded them by the fright shown by horses, cows, chickens and even the pigs, as they rushed under cover, endeavoring to get away from the moving shadow cast upon the ground by the huge balloon. Some short time later, the balloon was allowed to come near the earth so communication could be had with the occasional farmers, and this afforded the interested "Novice" the sport of endeavoring to ascertain their location. "Hello, there," would be called by the "Novice," and when the farmer's attention would be attracted, the "Novice" would ask, "Where are we?" The answer would come back, "Where are you going?" or "Where are you from," or some such other question, and rarely would they be able to get any information as to our whereabouts. However, one farmer, when asked, "Where are we?" replied, "Up in the air, you d—— f——."

This section of the country had rarely been covered by a balloon and our landing point, Roodhouse, Ill., was honored by its first sight of a balloon landing.

The landing was made at 2:30 p. m., and this, in itself, afforded interesting experiences to the "Novice," who had enjoyed the trip so much.

The landing point was selected and, as the valve cord was pulled, the balloon descended at great speed and headed for a patch of trees which was just on this side of our selected landing place. Immediately the drag rope was dropped, stringing itself on the tops of the trees for about 200 feet. This reduction in weight carried by the balloon checked its descent and we drifted along in a 15-mile wind, approaching our landing point at a slight descent, which gradually increased to a considerable speed. The descent was checked by throwing over one bag of ballast, and immediately after the basket had struck the ground, the balloon rose to a height of about 150 feet. The drag rope had been made fast by some farmers who had come to our assistance, and shortly thereafter, by use of the valve, the balloon settled to the ground and was deflated, the rip cord not being used.

The farmers and "town folks" were much interested and assisted us in packing the equipment, and the party of six was taken to the railroad station by the "town automobile agent," where we were honored by "hard drinks" in a "soft-drink town," and the party departed for St. Louis, reaching their destination in ample time to tell of their experiences and give thanks for their safe and enjoyable trip.

Balloon Up in Snowstorm

IN a snowstorm which had twice delayed the trip, Leroy M. Taylor piloted Miles M. Morris, S. F. Beckwith and Aeronaut Leo Stevens in the balloon "Cleveland," in an endeavor to reach New York, the wind being favoring, but the balloon landed at Amenia, N. Y. The distance of the voyage was about forty-five miles from Pittsfield, the starting point.

A new winter sport was inaugurated with this trip, for it is the intention of Mr. Taylor and New York men to make winter ballooning popular and to have semi-monthly ascents. It was Mr. Taylor's ninth flight.

While many were sitting close to the fireside in their homes, waiting for the storm to cease, the Taylor party was sailing through the upper air in the big balloon, of a capacity of 80,000 cu. ft., looking like a great aerial snowball. It was snow and ice from the basket to the valve, and with the ice hanging from the suspension ropes made a sight not to be forgotten.

Mr. Taylor is always ready to tell of the joys of ballooning. "No day is too cold for the man who has the spirit," he says, "to appreciate the grand scenery, the magnificent colors, the illumination of the sky, silvery threads of rivers far below. Houses look like dog kennels, people like ants, the barking of a dog can be heard from an altitude of two miles and the toot-toot of a locomotive from a still greater altitude."

The startling incident of the trip in the great "Cleveland" as it was sailing along in the falling snow squall was a collision with a flock of wild geese. The geese, caught in the blinding snow storm and the winds over the "Raggy Mountains," bumped against the gas bag, and for a moment the aeronauts were just a little excited, as the impact with the ice-covered bag made a sharp crackle as though something had snapped.

The party drifted south, along the New York and Connecticut boundary line and for a while

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The Master Magneto!

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The English Bowden Patent Wire Mechanism for all Controls; used on all Bleriot Monoplanes

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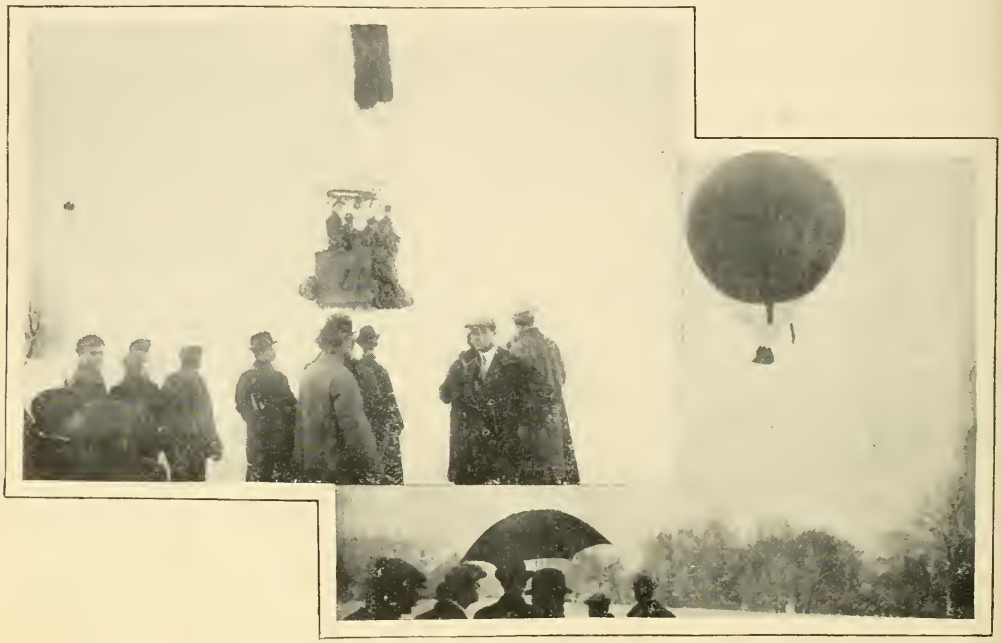
sailed gently in the great clouds of velvety soft snow, but as they got over Duchess County the winds caught the "Cleveland" and steered it into all sorts of crazy currents. Mr. Taylor tried several times to bring the baloon close to earth but on each occasion found the outlines of a mountain, warning him to ascend again.

Leroy Taylor, who has founded "The Fliers' Club," has climbed the mountains of Switzerland, on two occasions in 1890 successfully reaching the highest point of Mt. Blanc. His name is in the Gold Book of Switzerland, which adds to his honor. Mr. Taylor was born in Washington, D. C.,



The Start of the Taylor Trip

Night was rapidly approaching and the range of mountains made it difficult for one to land. Time and time again he tried for a landing but the snow was so dense that it was a difficult proposition and to make a landing in a snow squall of this kind required good judgment. The party finally landed safely on the outskirts of Amenia and at 9 o'clock arrived in the town none the worse for their great voyage.

in 1866. His first balloon voyage was in the "All America," in company with Pilot Stevens, J. D. Larkin, Jr., of Buffalo; G. H. White, Kokomo; J. H. Wade, Jr., of Cleveland; A. H. Morgan, of Cleveland; and Mr. Moulton, of Nashville. He became so enthused after his first trip that he continued ballooning. The following year he went abroad and made two ascents in Germany.

Sky Scrapings

Harry S. Harkness is leaving in a few days for Los Angeles with his Emerson-engined "Antoinette" and two new Antoinettes coming from Europe, for which he has ordered six Paragon propellers.

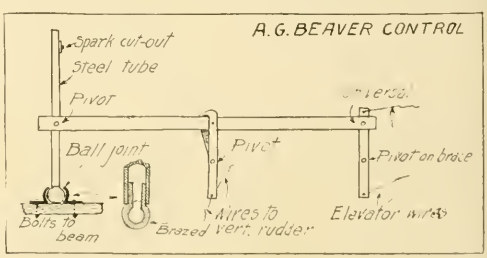
Clifford B. Harmon has announced his intention of flying across the Isthmus of Panama in March. He has sold his Farman biplane to the "International Aviation Co.," of Chicago.

J. C. McCoy has resigned as first vice-president of the A. C. A.

Frank Adams, of the Elbridge Engine Company, Rochester, N. Y., is building a Curtiss-type machine, with a Farman style chassis.

Samuel F. Perkins, 110 Tremont street, Boston, Mass., was left shy of funds when the St. Louis show petered out. He arranged to make a number of demonstrations with his man-carrying kites and besides going up himself more than a hundred feet on a seat slung from the kite rope, he sent up prominent men in St. Louis. From there he went to Kansas City to give further exhibitions. Here the highest kites collapsed and he was let suddenly down, but escaped without injury.

Albert G. Beavers, of the Standard Motor Car Co., Scranton, Pa., has completed a nice-looking machine of the headless biplane type, with Curtiss style ailerons and running gear. The planes are 6 feet 6 inches deep and spread 36 feet with 8 inch deep ailerons hinged on the rear beam. Cloth is on both sides. Ribs laminated spruce and oak and the struts are of oak almost rectangular in cross section, with the edges slightly rounded off. The planes are 6 feet apart. The ribs fasten flush with the front beam, but go on top of the rear. Sections of main lateral beams are joined by planes top and bottom, screwed. Curve, 1 in 12; angles, 2½ or 3 inches. A double plane elevator is in the rear, flat, controlled by wires to steering lever. Two vertical rudders, with wires to lever. The ailerons are worked by shoulder

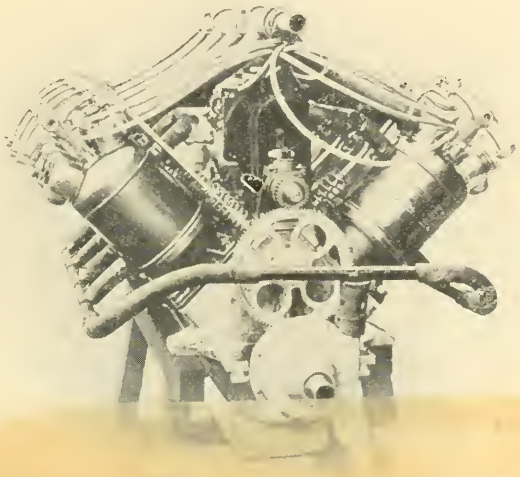


brace. The engine is a Rutenber automobile motor, lightened up, giving about 40 h.p. at 1,200. The engine weighs complete, including radiator, gas, oil, etc., 375 pounds. The propeller is 7 feet by 7 feet and is said to give 360 pounds at 1,200 r.p.m.—Geo. H. Scragg.

A Significant Fact

The successful debut at Mineola of Miss E. L. Todd's Aeroplane which flew on first attempt was made possible by a

RINEK ENGINE



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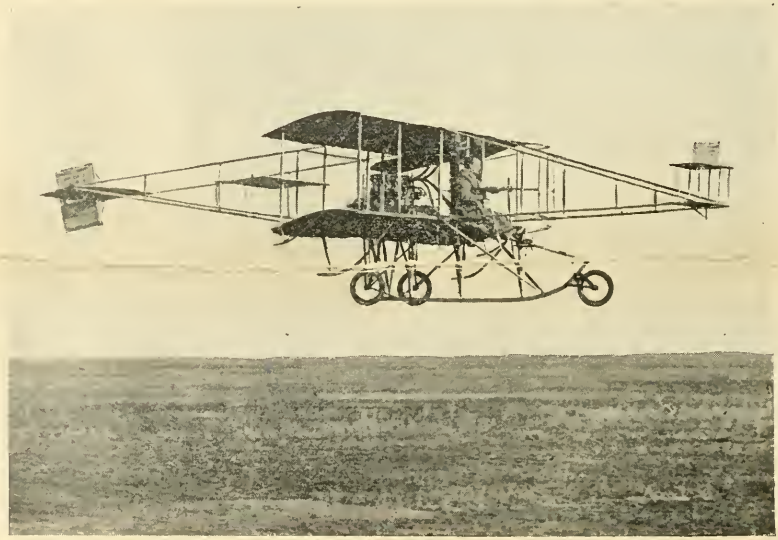


BURGESS BIPLANE AT HARVARD-BOSTON AERO MEET

Burgess Propellers

A Few Clement-Bayard Aviation Motors on Hand

Burgess Company and Curtis

Marblehead, Mass.

FLIGHT PROGRESS ABOUT THE COUNTRY

COLLEGE PARK FLYING GROUNDS

By Antony Jannus

COLLEGE Park has been associated in the minds of many with the Wright machines purchased by the government. It has been just a year last November when Wilbur Wright was instructing Lieutenants Humphreys and Lahm, since there has been any real flying here. College Park is the most promising aviation field near Washington and now boasts two hangars, a small grand stand and no fences. One can easily make a circle of two miles with fairly good alighting grounds always beneath. The recent completion of Rexford M. Smith's biplane has brought many Washingtonians to the field to witness the trials.

Mr. Smith is a successful patent attorney of Washington and one who has always been identified with bicycles, boats and automobiles and it would have been a great disappointment to his friends had he been slighted by the aeroplane "bug." His active interest in aeroplanes, like that of most of the local "aero-scientists," dates from Orville Wright's first appearance at Fort Myer, two years ago. The Rex Smith biplane, now at College Park is number two, number one never having an engine or a trial. Number one would probably have been a success but just about the time he should have had received his motor, his deposit was returned owing to the firm's inability to make delivery. Thus Mr. Smith turned to the nearby town of Alexandria, Va., and ordered an Emerson engine, six months ahead of time, and designed his machine accordingly. Number two is a record breaker for a second machine, as you shall see

FIRST FLIGHTS OF SMITH MACHINE

On Monday, Nov. 14th, the machine was taken out for its first trials. The wind was only about six miles, but enough to disconcert three rank beginners at flying. Mr. Smith, as designer and owner, took the first try at "grass cutting," the engine being throttled to less than half speed. Even at that the machine had a decided tendency to rise, and Mr. Smith cautioned Fred Fox, assistant designer and constructor, not to put the machine into the air. Mr. Fox had a successful run and after Mr. Smith and Mr. Jannus finished their "post mortem" of the second "grass cut," Mr. Jannus, engineer, tried his hand with equal success. Mr. Smith again took the helm and used the rudder successfully, running in circles or straight, as he desired. He also discovered that in order not to rise, depressing the tail (this causing the backs of the skids to drag) was all that was necessary, as the forward speed was therefore greatly retarded. Mr. Fox evidently argued the converse of this theorem and by keeping the skids parallel to the ground for about 700 yards, made two tottering flights with the machine traveling about 20 miles an hour into a six-mile breeze. After that 18 short straight flights were made before darkness closed the day. An examination of the machine revealed no trouble of any character—all the guy wires taut as before and everything ship-shape. The altitude record went to Mr. Smith with 15 ft., duration and distance to Mr. Fox, 200 yards. All of these flights were made with the engine throttled to 550 r.p.m.

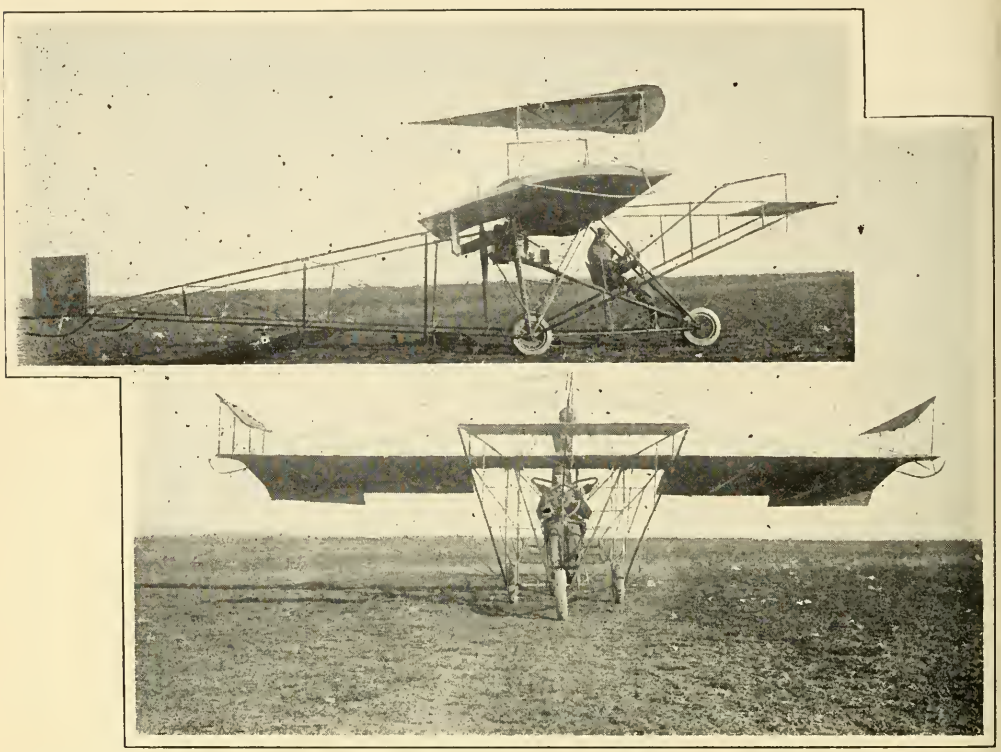
DETAILS OF MACHINE

The main planes of the machine are single surface and may be spoken of as of the Curtiss type although the joint for the struts is superior to those the writer has seen on any of Curtiss' machines and the guys are all 2100 pounds Roebling plated wire, fastened with a twist at each end and are without turnbuckles or solder. A tail only is used for elevation and depression with steadying fins in the front giving the appearance of the headless Wright machines. The engine is the Emerson six-cylinder, 60-120 h.p., 105 h.p. El Arco radiator and 9-inch diameter, 6-feet Paragon propeller in rear direct to motor. The main planes are 32 feet by 6 feet, and, with clearance for the propeller, amount to 360 square feet. The total weight, as flown, with small tank was 1050 pounds.

The Rexford Smith Machine

The pitch speed of the propeller, turned at 550 r.p.m. is just 396 miles per hour and it speaks well for the efficiency of the machine and propeller that it should fly so slowly. The engine has all its controls calibrated to function with one foot lever, which has stops for both maximum and minimum speeds and the maximum stop was so set as to prohibit acceleration of the motor other than that resulting from the difference in load on the propeller standing and in flight. The motor has turned this propeller 1100 r.p.m. and the flying speed with full power could be very fast, possibly sixty-two or sixty-three miles per hour. The pitch speed of the propeller at 1100 r.p.m. is 112.6 m.p.h. and the thrust 540 lbs. It would be of great interest if from this data any should care to furnish Mr. Smith with the theoretical speed in flight at 1100 r.p.m.

In subsequent practice flights, slight damage was done to the right skid by a rough landing shearing a bolt. This resulted in a broken propeller. On



The Walden-Dyott-Monoplane

Sunday, to please his friends, Mr. Smith put on an old 8-foot propeller, which was given him, and by turning this stick of firewood about 1,000 r.p.m., it was just possible to handle the machine. After a few straight flights of about 300 yards at 20 to 30 feet, Mr. Jannus essayed a turn and flew a mile and a half, making one and a half complete circles of the field and lit without mishap. Thus the machine has performed all its functions successfully and may be heard from again with good weather and the new Paragon propeller turning at 1100 r.p.m.

Everyone remarks at the fine workmanship of Mr. Smith and Mr. Fox, and all are filled with astonishment at the great strength of the machine. College Park residents boast that they have as fine an aeroplane as there is in the country and defy criticism of any detail of the structure for strength and simplicity. Mr. Smith's idea was to build a simple flyer first and try his ideas for stability, efficiency, passenger-carrying, etc., on a machine that should be a definite constant from which to figure. There seems to be nothing to retard him in fulfilling his modest desires.

To those familiar with the usual hazards to machine and operator in learning to fly, Mr. Smith's experience becomes nothing short of miraculous. By alternating with the three men, he tripled the chances for a smash. As has been said, there were three rank amateurs, neither of whom had ever operated a glider or a "motor bird" before. The breakage of the propeller was the result of a shock that would have wrecked most machines and occurred during trials on Thursday in a ten-mile cross wind. Another thing of great interest is that the first turns made in Mr. Jannus' circuit and a half of the field, were made to the left. As the propeller turns to the right the torque of the engine was favorably disposed to accentuate the banking to the danger point should the ailerons prove insufficiently effective. Furthermore, this torque was very noticeable with the inefficient propeller and the speed of the machine very slow, thus making a maximum of disadvantageous conditions on the machine. In several weeks of watching both Harmon and Grahame-White in their Farman machines, it has been their invariable custom to turn the machine to the left, as they use left-hand propellers.

Mr. Smith states that the skids and wheels now on the machine are only temporary and will be replaced before the new propeller is used. It had been Mr. Smith's intention to make a few trials during the Indian summer weather, then lock up until spring, but his signal success has broken down this resolution and more flights with the new skids and Farman type of double wheels, will be forthcoming.

The cloth is on the upper side only of the planes. Ailerons between the planes, in principle like the Curtiss. These, as well as the front and rear controls, are double covered with cloth. The horizontal surface in the rear has a movable rear portion for up-and-down steering. There is the usual vertical rudder for right and left steering. Short skids of white oak and spruce are combined with wheels in pairs, similar to the Farman arrangement. The rubber bands, however, are capable of being stretched by a lever device so that the tension can be increased or decreased to suit the load on the machine.

Flying at Mineola

The Walden-Dyott monoplane has been doing about all the flying at Mineola of late, with Mr Dyott as pilot. Even passengers have been carried on straight flights. Two other machines are building, which will be shown at the Palace Show

DESCRIPTION OF MACHINE

The machine spreads 26 feet, with plane 7 feet, fore and aft, a total supporting surface in the main plane of 182 square feet. In the rear is a horizontal lifting tail, 5 feet spread by 3 feet fore and aft. On top of this is the vertical rudder, $2\frac{1}{2}$ feet square. A single surface front control measures 5 feet spread by $2\frac{1}{2}$ feet fore and aft Above the main plane, at each extremity, is a fixed dart-shaped surface, each set at an angle to the horizontal, designed to impart natural stability. This system is plainly seen in the illustration Set in the main plane and hinged to the rear lateral beam are ailerons, which normally hang down, and lifting and following in the stream lines during flight.

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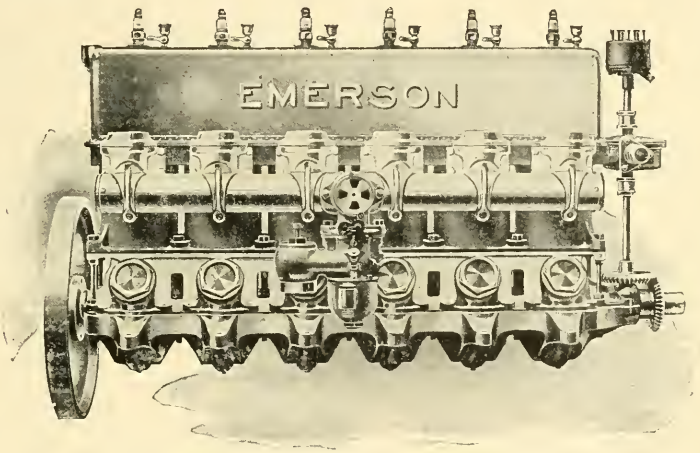

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All controls are in the steering column. Pushing forward or pulling back on the wheel steers down and up respectively, while turning the wheel to the right or left turns the vertical rudder accordingly by means of cables. Rocking the whole steering column left or right operates the ailerons.

A 25-30 h.p. Anzani, 3-cylinder, air-cooled motor, battery ignition, drives a Requa-Gibson propeller 6 feet 10 inches diameter by 3 feet pitch, which gives 260 pounds standing thrust. This does not mean that so much thrust standing is best, for the finest results have been obtained with but 230 pounds.

The whole machine is admirably mounted upon a 3-wheeled steel tube chassis supported by 20-inch by 4-inch Pennsylvania wheels. These tires being of such large size, not a single wheel has buckled nor punctured during the experiments. The main plane is so rigid that the whole machine, with aviator in seat, may be lifted by the tips of the wings without straining them or making the plane sag. The gas and oil feeds by gravity from the same tank. Gauges are fitted, showing oil and gas levels at all times. The framing is ash and spruce.

Messrs. Peets and Teetor, of the Hudson-Fulton Automobile Company, smashed up their Curtiss-type biplane on the first trial, in a 15-mile breeze. This was a finely constructed machine, with running gear similar to the Wright and the controls working a la Farman. Bowden wire was used for throttle control and the steel wire stays were made heavier at the ends where they screwed into the nipples. The turnbuckles were especially made and heavy at the part where they usually break.

A Japanese, H. Edano Eno, has finished a tandem monoplane, of very light construction, bamboo and spruce. The engine and propeller is between the two planes. The elevating plane is at the tail end. Lateral stability to be secured by small biplane cells underneath the forward main plane. Each tilts in an opposite direction to the other.

Marcel Penot has been making some flights in the Mohawk Aviation Company's Curtiss-copy, one cross-country of about 30 minutes with a new model 50 h.p. Harriman engine fitted. He is about to start on a southern exhibition trip.

At Belmont Park

There are a number of machines, some of curious construction, occupying the sheds at Belmont racetrack, Long Island, since the owners gave permission for flights by experimentors. C. W. Geddes has been making short flights with his Bleriot type, fitted with a 3-cylinder Humber engine. He wants to sell this and get a larger machine.

At the St. Louis Aero Fields

At East St. Louis, Ill., Aviators J. J. De Praslin, Ernest Swift, J. N. Sparling, C. W. Curzon and members of the Siegfried-Frank Company, with six aeroplanes, are camped at Washington Park for the winter.

De Praslin and Sparling have both made flights recently. Sparling has just purchased enough materials and a new motor for building a second biplane.

T. W. Benoist, of the Aeronautic Supply Co., of St. Louis, has been flying his Curtiss type at Kinloch Park, and on Dec. 10 did some great work. He has recovered from his recent accident during exhibition flights at Amarillo, Texas. In his last flight there he saw a couple of uprights in the elevator drop out, and he quickly decided to get down instanter. The front wheel hit with great force, due to miscalculation, and he was thrown out. The aeroplane passed on over him and the propeller severed his big toe, as well as cutting most of the skin off his face and head.

Ballard M. French has a tandem monoplane and H. C. Sweinhardt a biplane, with a "Detroit Aeromotor" power plant.

Curtiss Starts Training School

Mr. Curtiss arrived in Los Angeles on December 9, bringing with him a carload of experimental stuff and new parts of machine. He expects to open a large school and training grounds there. Of course, there is quite a bit of detail work to do before this will be under operation.

Mr. Curtiss has personally offered to train and instruct an officer of the army and an officer of the navy in the manipulation of Curtiss machines, giving them opportunity to take part in the experiments and observe the experiments which he will conduct this winter. The offer has been accepted by the Secretary of the Navy and one officer will be ordered to remain during the winter. Since the battleship flight, Ely has been invited by the Navy Department to try a flight from one battleship, landing on another. This invitation came from the Secretary of the Navy, and in his report the Secretary spoke of Ely's flight from the cruiser "Birmingham," and the future probability of aerial development. A number of army and navy officers who have heard of Mr. Curtiss' offer have made application to be detailed to take part in the experiments at Los Angeles and to learn to fly. It has aroused quite a bit of interest in the army and navy.

Los Angeles Meet — Gnome Engine on Curtiss

Los Angeles is a very busy place with the aviators nowadays. Curtiss is here, Captain Baldwin, Shriver, Latham, some of the Wright fliers. Willard, who has a new biplane along the lines of the Curtiss of his own design, with a Gnome engine installed, and W. C. Addosides, who made his first appearance at Mineola. These mentioned are only the Easterners. San Francisco has signed a number of aviators, three Wright machines, several Curtiss machines, Captain Baldwin, and possibly Latham.

The meet is now assured for December 24-January 3, and a contract has been signed with the Wright Company.

John Kowalsky, of Verona, Pa., is building an aeroplane of the general Curtiss type, except that he uses a central chassis or frame, triangular in shape, this containing the entire power plant. This frame is without wires and relieves the whole structure of the machine from engine vibration. Ribs are of aluminum, ½-inch square, and hollow. These weigh 1 ounce per lineal foot.

The Fred Shneider Biplane—Note Skids

Willard Flies Over Los Angeles

On December 10, Chas. Willard flew from Los Angeles to Pasadena and return at a height of 3,000 feet. A prize was offered for this feat, but the amount is not known. Willard has fitted a Gnome engine to his Curtiss, with a 7-foot 9-inch by 5.8-foot Paragon oak with spruce center propeller, and this was used in the flight.

Willard's flight stands as one of the most daring of cross-city flights. He started at a point west of the city of Los Angeles at 10:36 a. m., flew directly over the business district, on to Pasadena's commercial center and back, again over the center of Los Angeles and around the office of the newspaper, "Express," which promoted the flight. The trip lasted 1 hour, 10 minutes and the distance was about 55 miles. The flight was officially observed by the Aero Club of California. The Gnome engine was mounted on the same engine bed as usual in Curtiss machines, in a direct line with the front and rear control pivots.

Drexel's first figure for his flight at Philadelphia on November 23, was announced as 9,970. The barograph was tested by weather bureau officials, who set the mark at 9,897 feet. Up to date of going to press, the National Council has not received official report from its representatives, and no report has been made to the Aero Club of America.

J. A. Drexel's resignation from the Aero Club of America, has been accepted by the board of directors, and the charges under preparation by the club are withdrawn, as Drexel withdrew his letter of protest.

Aeroplanes En Tour

RALEIGH, W. VA., Nov. 16-17.—About half a dozen flights were made each day by Ely and McCurdy. On the first day McCurdy made a bad landing, smashing his machine, but this was repaired in time to make flights the next day.

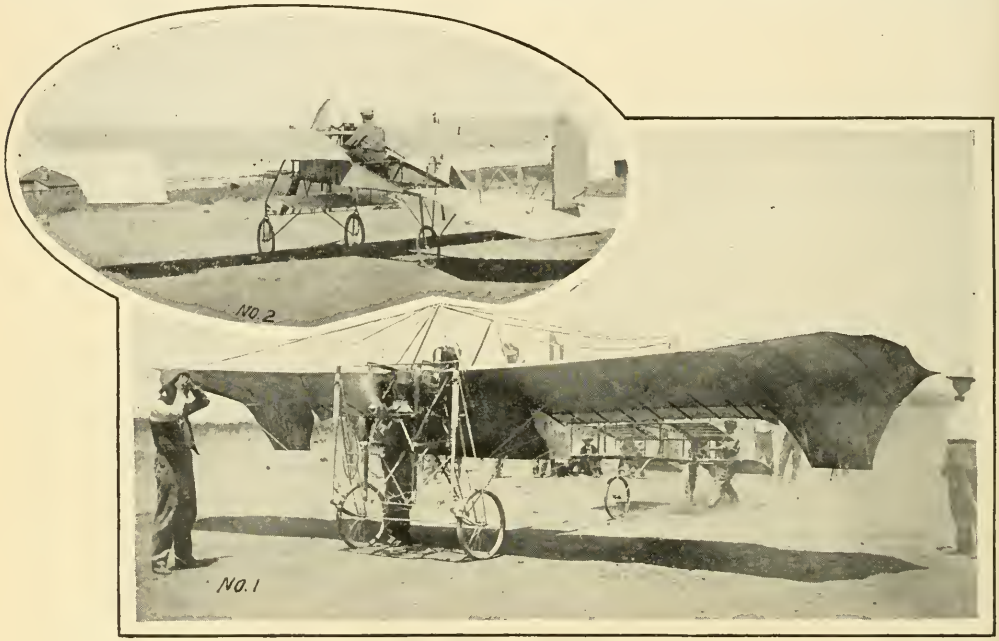
NEW ORLEANS, LA., Dec. 1-2.—No flights were made on the first day on account of wind. On the second day, McCurdy, Ely, Post and Ward flew. Mr. Post made several flights, but his machine was caught in a strong wind and was turned completely over, landing upside down. He was only slightly hurt. It was impossible for the machine to be repaired in time for him to make any more flights at that meet. On Nov. 30th, the day before the opening, Jas. J. Ward assembled his machine before any of the others and flew six miles across country at a height of 1,000 feet. This was made in a 4-cylinder Curtiss. Ward is a new Curtiss aviator, though he has been flying the Curtiss machine of James E. Plew, of Chicago.

COLUMBIA, S. C., Dec. 7-8.—Ely and McCurdy flew both days.

JACKSON, MISS., Nov. 28-29.—McCurdy, Ely and Post flew. The crowd was very small and the flights were made at Mississippi's first meet.

NEWARK, N. J., Nov. 24.—Chas. Morok, who is flying for Fred Shneider, made an exhibition flight on Thanksgiving Day, circling the grounds at good speed and doing extremely well. Hemmed in by trees and buildings, over which he had to fly, he had to land outside the park and smashed his machine. A short time ago he got his Shneider biplane with a 4-cylinder Elbridge engine and completed a circle of the Mineola field at the second try. The third was over the buildings there and the fourth several miles across country.

The Bleriot of S. Y. Beach was flown at Newark by Stratton, but he made only a jump. A couple of days later he made two more jumps and landed in a lake.



A. M. Williams Monoplane

Monoplane Flies in Arizona

A. M. Williams, of 1019 Eighth street, Douglas, Ariz., has been making short flights with a monoplane. The illustrations show the two machines he has built, No. 2 being the later one. His 3-cylinder Elbridge is being changed for a 4-cylinder one, of the same make with which he hopes to make sustained flights. Douglas has an altitude of about 4,000 feet. Following are some details of the machine:

Spread.—32½ feet, each wing being 6¾ feet by 15 feet. Double ribbed. Total supporting surface, 180 square feet. Continental cloth.

Power Plant.—Elbridge engine, cooled by vertical tube radiator of own make. Paragon propeller.

Running Gear.—Three-wheeled, Hartford tires and wheels.

Body of spruce, cedar and aluminum castings, stayed with turnbuckles and piano wire.

Weight.—500-550 pounds, complete with aviator. Length over all, about 22½ feet.

Drexel Fails of Altitude Record

According to a recent ruling of the International Aeronautic Federation, the existing height record must be exceeded by at least 300 meters (328 feet), before a new record may be claimed. This is made necessary by the inexactness of recording instruments.

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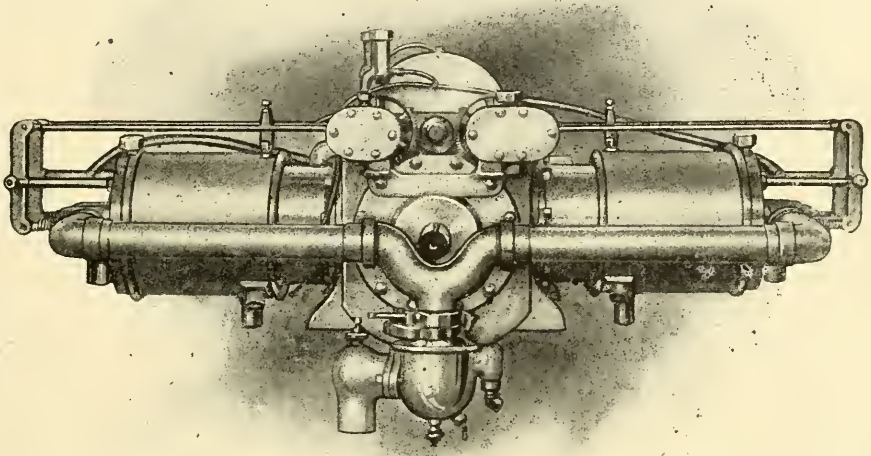

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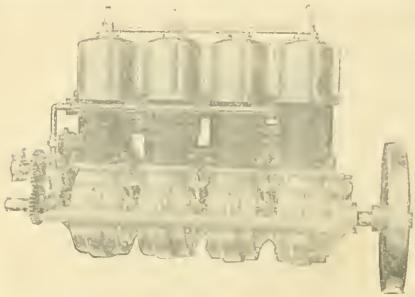

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40 h. p., 178 lbs.

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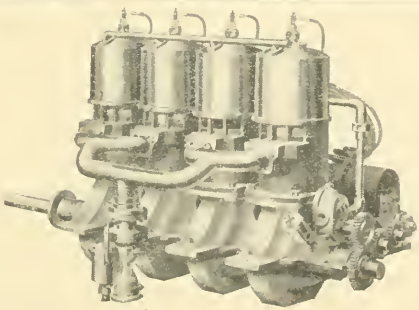


1911 "Aero Special"
60 h. p., 160 lbs.

Greetings

To My Friends—Through "Aeronautics"

for 1911

A. LEO STEVENS

OMAHA, NEB., Nov. 22.—Charles Bayersdorfer, 2582 Harney St., made a number of flights in his Curtiss-type.

BIRMINGHAM, ALA., Nov. 21-22.—Ely and Ward flew at "Jubilee" celebration. Ely carried a woman passenger, to the disgust of Mrs. Ely.

STOCKTON, CAL., Nov. 24-26.—Mars, Willard, Hall and James Radley.

HAVANA, Feb. 4-12.—Arrangements have been made with G. H. Curtiss for a meet under auspices Havana Post, endorsed by Cuban Government, at Camp Columbia, the government maneouvering grounds. The army will police the field. Eugene Ely has entered for the flight from Havana to Key West, about 90 miles over water.

RICHMOND, VA., Nov. 23-26.—The "International Aviators" (Moisant, Garros, Simon, Barrier, Hamilton, Frisbie), opened their first engagement here. Hamilton, Simon and Barrier flew over the city. Moisant circled the whole city. There was good flying but poor attendance. Seven cross-city flights were made, four in one day, by Moisant, Garros, Barrier and Simon.

CHATTANOOGA, TENN., Nov. 28.—Moisant aero meet petered out. Weather is very bad, wind high and gusty. Simon made the only real flight, which was sensational.

MEMPHIS, TENN., Dec. 1-17.—Though nothing of unusual interest occurred until the last day of the meet given by Moisant and his flyers, save the cross-city flight for $5,000 offered by the "Commercial-Appeal," which was won by Barrier, there was good flying. Nobody was seriously injured in the three bad falls that happened. The reported speed record by Hamilton was unofficial.

9,364 FEET BY MOISANT

On the 17th Moisant flew up to a height of 9,364 feet, according to his barograph. The company flies at New Orleans on the 24th.

Two Unique Fliers (?)

COOLEY'S MONSTER MONOPLANE

J. F. Cooley, at Rochester, N. Y., has built a curious machine, 81 feet in length, spreading 42 feet and weighing 2,800 pounds. The supporting surface is 1500 square feet. The car designed for passengers is 37 feet long by 2½ feet wide. The main supporting surface is diamond-shaped, of Naiad linen, without ribs, guy wires keeping the cloth from blowing upward. Two propellers are fitted, each driven by a separate 6-cylinder, 90-h.p. Elbridge engine. All controls operate by compressed air and even electric signals are installed between the pilot and the engineer.

The whole machine is mounted on a 4-wheeled chassis, using Goodrich and Hartford tires.

GARY'S FLYING MACHINE

William Gary, of Paterson, New Jersey, after years of experimentation with kites and models of various types, has built an aeroplane which he claims will maintain its stability without special devices. The machine is fitted with a tail of the Antoinette type, and the machine might be called a "barrel monoplane." Its action in leaving the ground and in flight is said to be similar to that of the monoplanes now in use, the only difference being the absence of stabilizing planes on the Gary machine. The finished product, while of unique design, impresses one with its perfect detail, finish, and general workmanlike appearance. Mr. Gary's faith in this machine is based upon successful towed by auto flights. In these flights, besides himself, the Gary machine carried 250 pounds of sand, and rose from the ground at a pull of 220 pounds, to a height of 20 feet.

In his second flight, under the same conditions, he required a full of 240 pounds to rise, the higher necessary pull being accounted for by the lowered efficiency of the plane being caused by the looseness of the cloth, which had been exposed to rain during the interim between two experiments.

Mr. Gary has installed a 50-h.p. Harriman power plant, which delivers a pull of 350 pounds, and intends to try out the machine on the ice of the Passaic River, as soon as weather conditions permit.

Death of Jacques Faure

Quebec, Dec. 2.—Jacques Faure, the famous French balloonist, who represented France during the Belmont meet, died from pneumonia after a hunting trip in Canada. He has made as many as, if not more, balloon ascents than any other man in the world.

Aero Calendar for the U. S.

Dec. 15-17—Atlanta, McCurdy, Ely, Post, Ward.

Dec. 24-Jan. 3—Los Angeles, Cal., big meet.

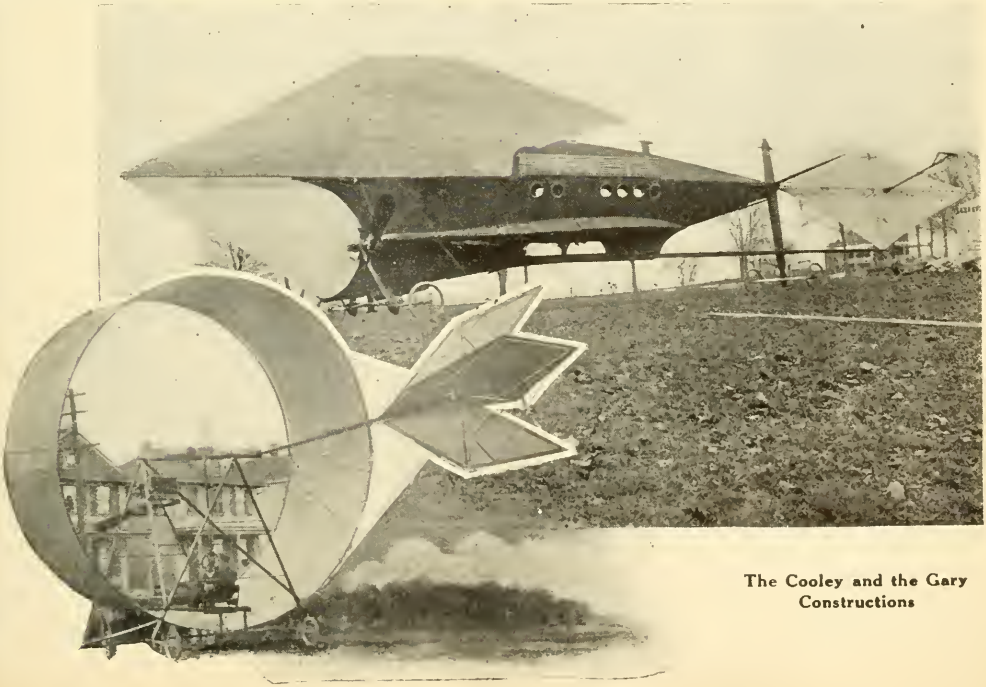
Dec. 31—Jan. 7—New York Aero Show, Grand Central Palace.

Jan 7-17—San Francisco, Cal., meet.

Feb. 4-12—Havana, Cuba, meet; Curtiss and other aviators.

Feb. 20-25—Boston, Mass., second annual aero show.

March 6-13—Chicago, Ill., aero show.



The Cooley and the Gary Constructions

NATIONAL COUNCIL CONVENTION

DESPITE the fact that the Aero Club of America made a fine altitude flight and landed smiling right side up, as usual, the December 6th meeting of the "National Council of the Aero Club of America," the first since its organization, and still dominates in the Council, things look much brighter for national aeronautics. The Club saw the handwriting on the wall once more and made public concessions without losing much of private control.

IMPORTANT FEATURES

The Resolutions Committee named at the meeting reported certain suggested changes, which were either adopted at once by the convention or left for the Executive Committee to consider and take action. These were made possible by the convention's accepting the Committee's report.

One change made it possible for this convention, and those in the future, to elect its own chairman of the Executive Committee, instead of having that chairman appointed by the Aero Club of America. Of course, the Club saw to it that the chairman named was one to their liking.

A paragraph was added to the agreement between the A. C. A. and the N. C., setting forth the objects of the Council to be the bringing into harmonious co-operation all properly organized clubs for the purpose of fostering and advancing the art of aviation (aerostation not considered, apparently), preparing proper regulations and furnishing supervision for contests, determination and classification of records, sanctions for meets, making decisions, encouraging research, awarding of honors for meritorious contributions to the art.

The present by-laws remain in force, except that recommendation is made that the newly-elected Executive Committee consider any changes which may be suggested and report, which report must be made to the members of the Council within sixty days. Suggestions were made by the Resolution Committee that the Executive Committee consider the incorporating of the Council, the changing of its name, the titles of its officers and the question of the basis on which clubs are to have representation in the Council.

Clause also added providing that the Constitution may be amended by a two-third vote of all members present in person or by proxy at a meeting of the N. C., provided that notice of such amendment be stated in the call for such meeting, at least thirty days prior to said meeting, and provided further that any such amendment shall not affect international relations or the obligations of the Aero Club of America in that respect.

THE JOKERS

The privilege of naming its own head is, for the Council, rather a forlorn one, inasmuch as the Aero Club of America did and will see that it controls the convention through its own and politically allied delegates and sweet promises to any others who may appear to be of an independent turn of mind. The name and form of the body may be changed ad infinitum but the A. C. A. will always hold the whip hand so long as the N. C. depends upon it for the obtaining of international recognition for any records which may be made. Of course, the Aero Club will retain this international relationship if it can for the sake of having this club over the heads of all the other organizations of the country. It is not likely that the A. C. A. will lose this foreign agreement until there is some other body in this country decmed by the International Aeronautic Federation fit for the making of a new international agreement. And the present outlook does not give any hope for any other body being capable of accepting such foreign agreement unless the N. C. takes the chance and breaks away from the A. C. A. and goes after the foreign affiliation for itself. And the N. C. will not break away so long as delegates to its conventions are persuaded by the A. C. A. people's outward offerings and inward takings.

CURIOUS REVERSALS BY A. C. A.

When the report of the Resolutions Committee was presented for approval, comprising the items mentioned above, it was sought by the delegates present for the purpose of reducing the Aero Club of America to the level of the other clubs, to table it and pass a resolution then and there taking from the A. C. A. the naming of the N. C. head, depriving the A. C. A. of one of its two votes and making of the N. C. a truly democratic national organization.

This was sternly opposed by the Aero Club delegate, a lawyer, and others, the chairman even arguing for the adoption of the report, which is against parliamentary rules. Their point was that it ought to be left for the Executive Committee to deliberate on and that the N. C., as it was to elect its own head and its own Executive Committee (previously slated in nice alphabetical order by the Aero Club) could and should instruct said Executive Committee in any way it chose, tell it just what the delegates wanted done, etc. These argumentative pills were so nicely sugar-coated that enough dissenters were won over to pass the adoption of the report.

Just as soon, however, as the Executive Committee and its head were "elected" by the delegates according to their choice, as foreseen by the thoughtful A. C. A., the independents again moved to instruct the newly-elected Executive Committee to the effect that it was desired that the National Council should be an independent body, truly democratic in character, with the Aero Club of America an integral part on the same basis as any other club. The same ones, who, a few moments before, were so free with their advice to instruct the Executive Committee now were highly wrought up at the insult to the Executive Committee, that instructions were the height of insubordination. This august committee which the delegates had the sole power of electing (?) should be unhampered by the wishes of the delegates. The motion was changed merely to put on record an expression of the feeling of the delegates as to what their idea of a National Council was but it was defeated, notwithstanding that several motions, quite conciliatory in terms, were offered by several "moderates" to satisfy the independents and bring harmony, in view of the fact that some delegates were instructed by their respective clubs to insist upon complete independence, for failure of which they might withdraw.

HOW THE EXECUTIVE COMMITTEE WAS "ELECTED"

During the first session the chairman was about to appoint a nominating committee when Harvard's insurgent delegate moved the anarchistic resolution that nominations for the Executive Committee be made from the floor by the delegates. It was carefully explained that this would be very cumbersome, that it would be so much simpler to let a committee do all the work. If the delegates didn't like the ticket they could make another themselves afterward. Swell chance! The vote of the delegates on the motion stood half for and half against, one delegate at first not voting. As the chairman announced that silence was considered for the motion, this delegate, who had telegraphic instructions in his pocket that he was to be on the side of fairness, democracy and equal rights, decided he would cast his vote for a nominating committee.

This nominating committee, consisting of Russell Alger, Jr., Dr. A. F. Zahm, A. A. Ryan, Dr. J. C. Eberhardt and Geo. M. Myers, met between sessions, with the soothing influence of dinner to aid their deliberations.

CLUBS REPRESENTED

The clubs represented, with their voting delegates, are as follows: A. C. of America, two votes (Wm. W. Miller and Dave H. Morris), Buffalo (J. M. Satterfield), Baltimore (J. H. Joyce), Pittsfield (C. F. Bishop), New England (C. F. Bishop), Milwaukee (C. F. Bishop), St. Louis (A. A. Ryan), Kansas State (W. B. Strang), Pennsylvania (A. T. Atherholt), Michigan (Russell Alger), Pasadena (W. E. Scarritt), Illinois (Victor Lougheed), Saratoga (G. A. Farnham), New Jersey (J. K. Duffy), Washington (Dr. A. F. Zahm), Intercollegiate (G. A. Richardson), Los Angeles (Ernest L. Jones), Harvard (J. V. Martin), Dayton A. C. (J. C. Eberhardt), Dayton Aeroplane Club (J. C. Eberhardt), Western Aero Ass'n (B. Sweet), Pittsburg (J. K. Duffy), Rochester (F. J. Dollinger), Ohio (R. H. Upson), Kansas City (Geo. M. Myers), Pacific (Israel Ludlow).

EXECUTIVE COMMITTEE AND HEAD

The Nominating Committee of the convention brought in the following list of names for the Executive Committee, which were pronounced to be

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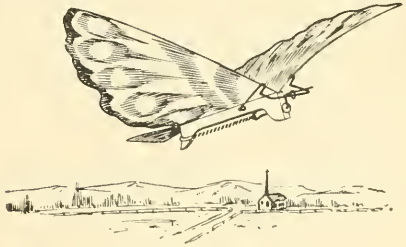

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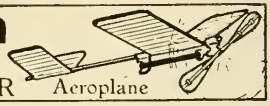

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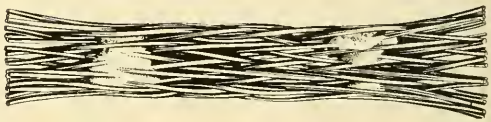

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elected by a vote for the adoption of the committee's report and which some delegates did not understand constituted a vote for the election of the nominees.: Robert J. Collier, Chairman; A. T. Atherholt, C. F. Bishop, J. K. Duffy, J. C. Eberhardt, J. H. Joyce, A. B. Lambert, Geo. M. Myers, James E. Plew, G. A. Richardson, A. A. Ryan, J. M. Satterfield, Dr. A. F. Zahm, George B. Harrison, C. B. Harmon.

After the close of the Convention, the new Executive Committee met and elected J. H. Joyce, treasurer, and J. K. Duffy, secretary.

Contrary to the fate of most of the progressive motions, the one requiring the new Executive Committee to report to the various clubs comprising the Council its plans and changes in the constitution and by-laws, if any, and name, within sixty days from the date of the meeting, was passed.

SOME OF THE REMARKS

At the opening of the second session, Mr. Havens, a whole-hearted gentleman from Missouri, got the floor and said he had travelled 9,000 miles in connection with a national organization and wanted to get started right this time. He wanted to have a platform first and then elect officers afterward. He wanted to know if the N. C. was to be dominated by the A. C. A. He wanted to declare independence, reducing the A. C. A., etc. "I want this institution divorced from the A. C. A. If we are not to stand on our own bottom, with no individual or club having us to refer to them, then we had better go out of business and I so move. . . . Let's get a platform and then take up the election of officers, if I can get a seconder to it, organize, change our name as some individual organization, but let's get an organization that is independent and free and do what we want. As soon as you get a platform, get down to business and elect officers."

Ludlow wanted to know where the N. C. was tied to the A. C. A. and Havens referred him to the agreement of the N. C. with the A. C. A., which says:

"Whereas, in accordance with the constitution of the Aero Club of America providing for the organization of a National Council of representatives of clubs affiliated with the Aero Club of America, the Aero Club of America has called this meeting of representatives of such affiliated clubs for the purpose of organizing such National Council.

"Now, therefore, this agreement is hereby adopted as the agreement of organization of such National Council.

"The Aero Club of America hereby authorizes the organization of the National Council of the Aero Club of America. The Aero Club of America is confirmed as the representative of the International Aeronautic Federation."

W. W. Miller, attorney of the A. C. A., spoke, saying the A. C. A. had never interfered with the N. C. and wanted any changes in name, etc., to be entrusted to the Executive Committee about to be elected.

Havens said: "That is the very reason I am raising this question of having matters referred here and there when we can settle this proposition now, change the name and organize an independent institution and we won't have to refer to any committee."

This caused great discussion. The chairman made a long speech on the "great work the A. C. A. had done," its strength, that the "N. C. needed its help and must keep in accord with it."

A. T. Atherolt read a resolution, that whereas, "by reason of the fact that the N. C. has been placed in such a position that many actions are hampered, and in the opinion of many, that the N. C. is under the restralning influence of the A. C. A.," he asked the convention to renounce the A. C. A. and put it on the same footing with others.

Atherholt tried to tell of the failings of the A. C. A. but was prevented by the chairman from saying anything unpleasant about the A. C. A.

Miller spoke strongly of the kind feelings the A. C. A. had for the N. C., what it wanted to do for the N. C., how much the A. C. A. had given up, etc.

Lee S. Burridge, who was present holding an alternate's proxy and, therefore, not voting, moved a conciliatory measure, that "the executive committee be instructed that the sense of this meeting is that in its deliberations it should consider that no club should have more votes or more privileges than another, and that all clubs should be on the same basis, no matter what method of representation might be adopted."

Miller considered it an insult to the Executive Committee to restrict their free deliberations on the subject, and others spoke, so Burridge, finding that the object sought, namely, harmony, was not to be attained, withdrew the motion.

J. K. Duffy offered a resolution that " as it is the purpose of the N. C. that it shall be in fact an absolutely independent national body, upon democratic lines, that will represent all properly organized aero clubs that may seek membership in it; and whereas, we are now on the threshold of a reorganization of the body; resolved, that the members of the N. C. declare it to be their purpose to effect an independent body representative of all aeronautic interests throughout the U. S. and to that purpose the delegates of the clubs here assembled pledge themselves." This was offered by Mr. Duffy as another conciliatory measure to satisfy all, but was strenuously opposed by the Aero Club people. Joyce said: "As a member of the Aero Club of Baltimore, I cannot subscribe." Miller, a co-member on the resolutions committee, said that since Mr. Duffy had not had time to properly prepare his resolution, it should be left to the Executive Committee to take the subject up untrammelled by any hasty instructions. Finally the resolution was withdrawn.

A motion was made and carried to the effect that the Executive Committee be authorized and instructed to make special inducements for a period of six months to attract all clubs to join.

Resolutions were passed on the deaths of Jacques Faure, Ralph Johnstone and Octave Chanute. A plan was started to have a Chanute Trophy.

EXTENSION OF DEWEY DECIMAL SYSTEM TO COVER AERONAUTICS

By L. P. Brode

ALL knowledge gained by a man may be classified by the Dewey Decimal System, devised some years ago by Mr. Melvil Dewey, of the New York State Library. As many of the modern arts and sciences were at that time in their infancy, or even unknown, no provision, or an inadequate one, was made for them. Engineering and allied subjects have been provided for in "An extension of the Dewey Decimal System of Classification Applied to the Engineering Industries," Bulletin No. 9 of the Engineering Experiment Station of the University of Illinois, Urbana, Ill. The writer has arranged a further extension, to cover the subject of Aeronautics, Dewey System number 533.6.

533.6 Aeronautics.
.61 Aerostation.
.611 Free spherical balloons.
.612 Dirigible balloons.
.62 Aviation (Heavier-than-air machines.)
.621 Monoplanes.
.622 Biplanes.
.623 Multiplanes.
.624 Tetrahedral machines.
.625 Helicopters.
.626 Ornithopters.

In connection with this may be used the Dewey "form divisions" as follows:

01 Philosophy or theory
02 Compends, text-books, etc.
03 Cyclopedias, dictionaries
04 Essays, addresses
05 Periodicals
06 Societies
07 Education, teaching. Schools, colleges, universities
08 Tables, calculations. Miscellanies
09 History. Progress and development

To illustrate: Articles in the March **Aeronautics** may be indexed as follows:

Center of pressure on arched surfaces	533.62(08)
Model flying, the new sport	533.62
The Los Angeles Aero meet	533.6(09)
Four new world records	533.62(09)
The Pfitzner monoplane	533.621

etc.

News In General

Belmont Promoters Enjoined

On December 6, a temporary injunction was granted the Wright Company, in an action to compel payment of $15,000, restraining the Aero Corporation, Ltd., from paying out any more money until the terms of the alleged agreement with the company were complied with.

According to an affidavit submitted by the complainant, the Aero Corporation paid $10,000 in cash for the participation of the Wright machines, and agreed to pay further the surplus of the gross receipts over $125,000 up to the sum of $15,000, making $25,000 in all. Grahame-White got $13,600 for himself alone, according to the prize list, while the Wright Company had Brookins, Parmalee, Hoxsey and Johnstone flying.

It is said in the affidavit that the gross receipts of the meet were over $200,000, while at the time the agreement with the Wright Company was executed, $125,000 was subscribed to conduct the affair. Prior to the execution of the agreement, complainant states, the Aero Corporation offered to pay the full $25,000 in cash, but that thereafter some of the subscriptions were said to have been withdrawn, and it was finally agreed that the complainant company would take its chances on remuneration beyond the $10,000.

The affidavit charges that sums are being paid out from the receipts, and it is possible that unless protected by the court, such distribution of funds will be made that the defendant may be left wholly without money to pay the Wright Company. It is also alleged that payment has been repeatedly asked, but that deponent has been informed by defendant, "payment will be held up until after all other indebtedness of the defendant has been discharged and that they doubted whether funds to satisfy the claim would then remain." Further, the Aero Corporation has a capital stock of but $500, and "such corporation defendant is an organization incorporated chiefly for the purpose of conducting the aforesaid meet, and is wholly without assets or prospect of assets, except those derived from such meet, and was formed at the instance of the Aero Club of America for the temporary purpose of running this meet, which was really being held under the auspices of such Aero Club, and to assume the liabilities thereof."

Allan A. Ryan, president of the Aero Club of America, general manager of the meet and, at one time, at least, a stockholder of the Wright Company, is reported in the New York Times as calling the action of the Wright Company, "A disgraceful attempt to force the corporation into giving up $15,000, after it had lived up to all its obligations and fulfilled its contract with the Wright Company to the letter.

"While the Aero Corporation is trying to advance the science and art of aviation, the Wrights are imbued only with the spirit of commercialism, and have little or no interest in the real science.

"The Wrights may be assured, the Aero Corporation will not repudiate any just debt or obligation, but the officers of the corporation will not submit to any attempt to collect money that is not owed."

SUIT AGAINST WHITE

Just before Grahame-White left for dear old Lunnon, papers were served upon him in an action brought by the Wright Company, alleging infringement. No injunction was taken, and the suit is more or less one for an accounting and for damages sustained by the complainants.

No action has been taken as yet against the Moisant group.

New York Aero Show Biggest Yet

Another floor has been added to that set apart previously for the aeronautic show in connection with the International Automobile Show in Grand Central Palace, Dec 31-Jan. 7. All the space available for full-sized machines has been about taken up. Special provisions have been made for the showing of accessories, such as propellers, motors, etc., and space is being rapidly taken in this line.

A partial list of exhibits already contracted for has been given out.

Among the prominent aeroplanes to be shown are:

A Wright machine, which has been built for Russell A. Alger, of Detroit, and the "Baby Wright" that Johnstone used in making his world record altitude flight; the Bleriot in which John B. Moisant flew from Paris to London, making his famous channel flight carrying a passenger with him. This machine is now at the Lovelace-Thompson aeroplane works being repaired. Another Moisant machine of all steel construction, which it is expected will successfully resist heavy strains in flying against sudden "pockets" of wind and shocks in alighting; a third machine of Moisant's, in which he made his famous flight across Brooklyn and around the Statue of Liberty; a Santos-Dumont "Demoiselle," which has been brought over from France for the exhibition; two machines built by Burgess Company and Curtiss, one of which is a large passenger-carrying biplane, and the other being a smaller biplane; a Lovelace-Thompson passenger-carrying aeroplane, and a racing machine built by the same company; Glenn H. Curtiss's famous machine in which he made his remarkable flight from Albany to New York, winning the $10,000 prize given by the New York World; a Bleriot type monoplane, built by the Scientific Aeroplane Company of New York, in which a gyroscope has been installed to demonstrate the balancing and stabilizing power of this invention as applied to aeronautics; a Bleriot type of monoplane made by the Matz Company, of Waltham, Mass.; a monoplane of original type manufactured by the Walden-Dyott Company of New York; a biplane built by C. & A. Wittemann, of Staten Island; a dozen other machines of types not so well known, several of them of odd and novel construction.

The Aeronautical Society will display models in a special exhibition booth, which is to be devoted to the interests of that organization. In another booth the Aeronautic Reserve will have an exhibit which will be of great interest. The Reserve was organized to excite public interest in aeronautics and for the purpose of aiding the army and navy in time of need. Two tents, such as the one which was erected at the Belmont Park Meet, are to be set up in the exhibition space and numerous persons prominent in aeronautics, are to be in daily attendance.

The Fliers' Club, an organization composed mainly of theatrical folk, including a number of high-fliers, is to have a section in the aeronautical division. The Junior Aero Club, under the direction of Edward Durant, is also to be represented at the show.

Exhibitions of special attractiveness in the Aviation Division will be the showing of aeroplane accessories, consisting of engines, parts, ailerons and other sections of machines which may now be ordered and supplied upon a few hours' notice in case of accident.

Boston Aero Show

Boston is to have another indoor aerial show. It will be held in the Mechanics' Building, as was the one last year, and will run one week, from February 20 to 25. It will be managed by Chester I. Campbell who, last year, with the material available, certainly made a most creditable showing. That this year should mark, not only an increase in interest, but an improvement in the nature of exhibits is assured.

The Harvard-Boston meet was a very successful event, and stirred the interest of even those who, up to that time, were skeptical of the future of aviation, and since then, many have had the desire to see the celebrated types of aircraft at close range, with the result that Manager Campbell has received many communications requesting him to repeat last year's show.

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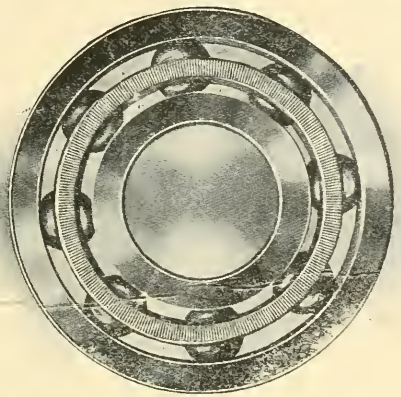

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¶ Fox Aero Motors are the simplest, most reliable and most powerful Aeronautic Motors yet produced. They are two-cycle water cooled, and are guaranteed against overheating under all conditions. They are equipped with the Fox Fourth Port Accelerator, the greatest improvement ever made for increasing the speed, power and flexibility of two-cycle motors.

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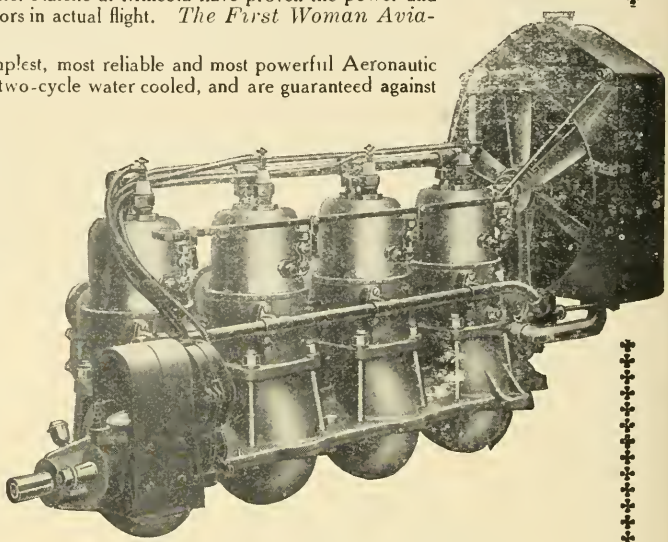

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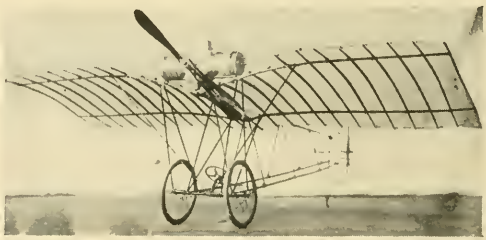

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While the exposition of last year presented no less than 18 full sized machines, as could not be otherwise than expected at that stage of affairs, most of them were in the experimental stage, but this year's exhibits will be an improvement, inasmuch as several of the actual machines, as well as types that have broken records, will be shown.

A number of indoor exhibitions of aeroplanes have been held throughout the country since the first show given in Boston, but it has been generally conceded by those who have witnessed them all, that the Boston Show took first rank and, as in the past year, such marvellous strides have been made in the science-sport, every indication points to a great success in the coming exposition. Special prizes will also be offered for flying models, and as the price of exhibiting space for accessories has been put to the lowest possible figure, it is expected that all the adjuncts will be shown.

Manager Campbell is certainly to be congratulated for his efforts to stimulate interest in aviation in the East, and should have the support of everyone interested in aeronautics. All communications regarding space or other matters connected with the exposition, should be addressed to Chester I. Campbell, general manager Second National Exhibition Aerial Craft, 5 Park Square, Boston, Mass.

Book Reviews

EQUILIBRE, CENTRAGE ET CLASSIFICATION DES AEROPLANES, par R. Saulnier, ingénieur E. C. P.—Un volume in 8mo. Prix: 3 francs.—Librarie Aéronautique, Editeurs, 32, rue Madame, Paris.

Cet ouvrage offre un intérêt particulier par le fait qu'il résume les observations et les travaux sur l'aviation d'un véritable spécialiste, son auteur ayant en effet une longue pratique de la construction et du pilotage des biplans et des monoplans.

On y trouvera l'exposé des considérations qui régissent la construction d'un appareil aérien et l'analyse des qualités particulières que présentent les types les plus connus.

L'ouvrage commence par une étude mécanique du vol d'ou l'auteur déduit la classification des planeurs et aéroplanes, puis suivent des chapitres absolument inédits sur le "virage", la "tenue dans le vent" et le "vol plané".

Johnstone's Death

The opinion of an expert on the sad accident, at Denver, in which Johnstone lost his life, is of interest to those who have tried to figure out the direct cause of the fall. One observer is said to have noticed Johnstone fold up his glasses and put them in his pocket, drop his cap and goggles to the ground, and then get out of his seat and crawl to the back of the plane. No aviator would leave his seat at such a height, surely. His action of putting his glasses away during the drop is one inexplainable.

The opinion first mentioned is as follows:

"Johnstone had no difficulty flying his machine the first day, and nothing happened to his running gear. On landing in the narrow race-track, his left wing ran against the fence, splitting a bow. Rather than repair it, they simply took it off and put on a new wing. From everything that can be learned, it now appears that nothing whatever was the matter with the machine, but that he banked too steeply, reached the vertical and then warped his wings as far as they could go, to try and recover his balance. This would give the appearance, from the ground, of the wings on one side being bent down, and on the other side, being bent upward, and to the uninitiated this would look as though the wings were out of control or broken. It is evident that after the machine toppled over, he lost his seat and the control of the levers, and even after the machine had righted itself on the way down, he was unable to get hold of the levers and continue the balance. The breaking strain of the wires used in the warping levers is about 2,400 pounds, and it would be impossible to even approach this strain as long as this machine is in the air."

Incorporations

The Carter Aeroplane Co., St. Louis, Mo. Capital stock, fully paid, $7,000. Incorporators—D. B. Hyde, Beaer, Pa., 20 shares; O. H. Hyde, 19 shares; L. A. Carter, 20 shares; C. G. Andrews, 10 shares; Joseph Tremayne, 1 share. To manufacture and deal in toys, etc.

Duquet Aeroplane Co., Manhattan; construct aeroplanes, etc. Capital stock, $1,000. Incorporators: Louis G. Duquet, Chas. W. Reynolds, Rene Duquet, No. 107 West 36th street, New York city.

The Curtiss Aeroplane Co. of Hammondsport has been incorporated with a capital of $20,000. The directors are Glenn H. Curtiss, Lena Curtiss and G. Ray Hall.

The Fischer Aero Craft Construction Co., capital stock $100,000. Directors: P. J. Fischer, E. C. Cusack, F. C. I. Barlow, C. W. Pinney, T. C. Van Epps, Los Angeles, Cal.

Western Aviation Co., Oroville, Cal. Orvar Meyerhoffer, Laurence Gardelia, C. E. Howard, J. M. Chubbuck and M. Schubener. The capital stock is $75,000.

Baltimore, Md.—E. R. Brown, 3818 Roland avenue, is reported organizing Brown Aeroplane Works with $50,000 capital stock to establish plant to manufacture aeroplanes.

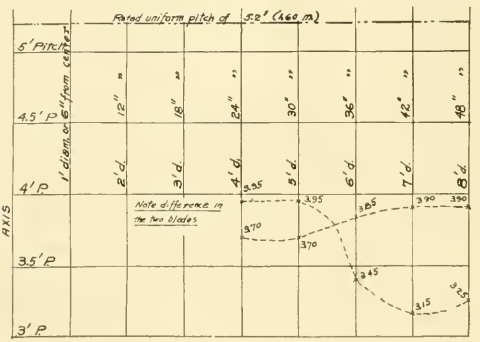
Bridgeton, N. J.—The George E. Cove Biplane Co., of Bridgeton, N. J., will be incorporated; capital stock, $100,000. The purpose of the company is to manufacture flying machines, one of which is now nearing completion.

Birmingham, Ala.—The Birmingham Aeroplane Co.; capital stock, $5,000. Incorporators are: Jesse W. Alexander, R. B. Alexander, Hugh A. Locke, Edgar P. Self.

International Aviation Co., Chicago, Ill., $5,000; manufacturing and dealing in flying machines, appliances, etc.; George A. Haskell, Harvey G. Badgerow, William J. Doyle.

Wadsworth Airship Co., Pittsburg, Pa.; capital stock of $20,000. The incorporators are John W. Wadsworth, Frank J. Schellman, E. E. Cranmer, Alexander W. Henry and John F. Milliken.

One of the best known French propellers, supposedly a true screw, of the usual size, supplied to Bleriot machines, 2.5 m. (8.2 feet) by 1.6 m. (5.2 feet) pitch, was found by a curious individual (who had the peculiar idea that both blades of a propeller should be somewhat similar) to be slightly at variance with the figures stamped on the hub as above noted.



The propeller actually measured close to 8.5 feet, and neither blade had the marked pitch of 5.2 feet. One had a pitch at 3.5 feet from the axis of but 3.9 feet, while the other blade at the same point had a pitch of 3.15 feet. The highest pitch found was but 3.95 feet at the point from which measurements were begun, i. e., 2 feet out from the axis.

It says somewhere in the Bible that the lion and the lamb shall lie down together. The Aero Club of America is to have a meeting on January 6th in memory of Mr. Chanute. The president of the Aeronautical Society, Hudson Maxim, is to be asked to address the meeting and the members of the Society are to be invited.

CLUB NEWS

"The Flyers" is the latest club in New York, the ambition of which is to have no members but those who actually get in the air literally. Sixty founders met at a banquet at Delmonico's on December 4, and pledged their intentions to depart from established parlor lines and make good on the name.

The club was organized by Leroy M. Taylor, a prominent New York sportsman in ballooning and yatchting and club man, who drew liberally on the New York Yacht Club and the Lambs for enthusiasts. Joseph R. Grismer, who presided at the banquet, is Shepherd of The Lambs, and other members of this unique club are: George Broadhurst, George Ade, George V. Hobart, Augustus Barratt, Ernest Smillie, Robert Hilliard, Col. James Elverson, Jr., Mason Peters, Clarence Harvey, Louis Sanger, who has bought a Curtiss and a Bleriot-type; Booth Tarkington, A. Leo Stevens, Geo. W. Gregory, N. H. Baruch, Harry T. Eschwege, Col. Jacob Ruppert, Mortimer W. Smith and William L. Stowe.

Mr. Taylor has offered a cup to the member making the longest trip from North Adams or Pittsfield.

An Aero Club is being formed in Bristol, Tenn.-Va., and a preliminary meeting has been held at the Y. M. C. A. All men interested are asked to send their names to C. W. Morey at the Y. M. C. A.

The Aero Club of New England has elected the following officers: H. Helm Clayton, president; Nathan L. Armster, first vice-president; J. Walter Flagg, second vice-president; A. R. Shrigley, secretary; Harry G. Pollard, treasurer; Professor A. Lawrence Rotch, W. H. Pickering, Charles J. Glidden, Timothy E. Byrnes, Jay B. Benton and Harry Howard, directors.

The **Aeronautical Reserve** announces a $1,000 prize to the first member who succeeds in flying from the deck of a vessel one mile or more at sea, and landing on the same ship.

The Aero Club of New Jersey has been incorporated with headquarters in Hackensack. The incorporators named are Messrs. Harry P. Ward, William M. Jacobs, James K. Duffy, Augustus Post, W. R. Prinkman, Theodore Borttger, William P. Eager, Alfred Morrell and W. J. Wright.

The New York Model Aero Club has been organized in New York city to popularize and study the science of aviation through models. The directors of the club are as follows: Edward Durant, honorary president; W. X. Picella, president; C. L. Ragot, F. Shoeber, vice-presidents; H. W. A Maass, secretary-treasurer; L. F. Ragot, Leo Stevens, A. Lacroix, G. Carisi, J. Roche, R. S. Barnaby and H. E. Ragot.

The club meets weekly on Saturday evenings.

The **Dartmouth Aero Club** has been organized with John W. Pearson, president; Louis P. Hall, vice-president; Richard F. Paul, secretary; James M. Mathes, treasurer.

The club intends to purchase a glider at once, adding more if success crowns the efforts. The club already has a small but good library, consisting of **Aeronautics** and other periodicals and several books. From time to time lectures will be given by experts and readings by members of the club. Here's success!

The **Aeronautical Society** is desirous of learning the present address of the following members. Those who know their latest address, please advise at 1999 Broadway, New York:

Mr. Chas. H. Deacon,
Mr. Ernest Stahl,
Mr. C. C. Lundin,
Mr. F. Langi,
Mr. Geo. A. Brown,
Mr. L. A. Hunton,
Mr. J. C. Stevens,
Mr. F. Braudner,
Mr. Percival G. Doty,
Mr. P. F. Mattelay,
Mr. Morris Bokor,
Harsfa Utca,
Mr. Jos. W. Ball,
Mr. Walter J. Plunkett,
Mr. R. E. Ernst,
Mr. H. A. Bussing
Mr. Allen E. Dickerman,
Mr. L. S. Hebbard,
Mr. J. C. Kirkner,
Mr. Earl Kaake,
Mr. G. R. Loveday,
Mr. L. G. W. Schroeder,
Mr. Francis Von Stern,
Mr. Reinard Sturm,
Mr. Francis de Sasso,
Mr. Lewis Vitoch.

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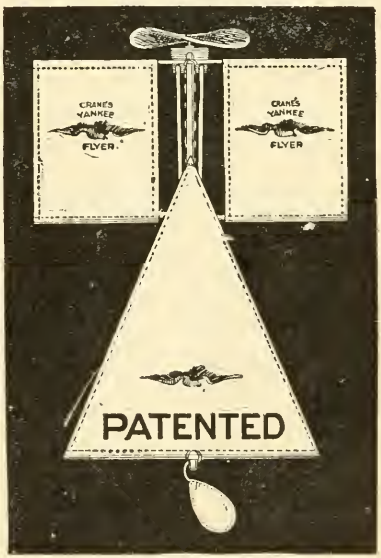

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PATENTS

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CHAS. E. BROCK, PATENT ATTORNEY

913 F STREET, WASHINGTON, D. C. 256 BROADWAY, NEW YORK CITY

I HAVE IN MY OFFICE COPIES OF ALL PATENTS GRANTED FOR AEROPLANES

MY PARIS TO LONDON FLIGHT

(*Continued from page 2*)

and wind, and really it was all I could do to keep in the machine. I was cold and had cramps in my hands. From 800 feet I dropped to 300 feet and landed in a wheat field near a brick yard at Tilmanstone. The next morning we started for London. Everything went well until I got near London when one of my connecting rods broke. I repaired the rod in a few hours and was off again, but I did not notice the rod had played a little mischief with one of the magneto gear wheels and it was almost broken. In five minutes the wheel broke and there I was over a forest and a chalkpit. I saw ahead a little spot where they had dug out to make bricks, about seven hundred feet long by three hundred feet wide. "If I can only make that spot," I thought, "I'm all right." The half hour's ride to London took me two weeks to accomplish. Automobiles were offered me to go over the route to London but I decided I would not take an automobile if I never got to London. I started in an aeroplane, and in an aeroplane I must get to London. And eventually I got to London.

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EXCHANGE AND FORUM

PRIZE NEEDED FOR EXPERIMENTS

In the course of some correspondence with Mr. W. R. Turnbull, of Rothesay, N. B., Canada, who is known all over the world for his work in aeronautics, the matter of prizes for experimental work was discussed and we have taken the liberty of printing below a portion of Mr. Turnbull's letter:

"The popular opinion, notwithstanding, the **science** of aeronautics is in its infancy and should be encouraged, as we cannot hope for a **satisfactory solution to the problem of aerial navigation** until we have more scientific knowledge. If the money that is at present spent in aviation meets, the big prizes meaning simply a disproportionately large loss of life in accidents, were applied to solving the many problems that are presented to the thoughtful designer, the advancement of the science would undoubtedly be more rapid."

HELICOPTER PATENT FOR SALE

W. E. Colyer, Box 391, Saranac Lake, N. Y., has patent 897,738, Sept. 1, 1908, to dispose of. The machine covered therein is of the helicopter type, comprising two superposed screws or discs on concentric upright shafts driven by bevel gears, and rotating in opposite directions. There is a framework upon which is mounted the engine, drivers' seat, etc., with means for shifting the center of gravity by a lever in order to tilt the lifting screws and give the whole apparatus a forward movement. Steering right and left is effected by a vertical rudder at the rear of the frame.

There are two claims in the patent, abstracted as follows:

A flying machine comprising a main frame, oppositely rotating propellers carried thereby, a supplemental frame suspended from the main frame, said supplemental frame comprising hangers pivotally connected with the main frame, a bottom bar pivotally connected with the hangers, and a link joining the hangers above the bottom bar, drive gearing supported by the main and supplemental frames for driving the propellers, and adjusting means connected or associated with the bottom bar and link of the supplemental frame to change the center of gravity of machine

CENTER OF LIFT

Question.—I am building a monoplane something on the order of the Bleriot, and would like to know just where the center of lift of my plane will be when in flight, which I judge will be approximately 40 miles an hour. Curve of plane ribs to radius of 28 feet, true circle, 7 feet in depth (chord), 6 degrees angle of incidence. L. G.

Answer.—Radius of 28 feet gives curvature about 1 in 28. Eiffel figures for 1 in 14 at 6 degrees give 43 per cent from front; M. B. Sellers, for 1 in 24, 6 degrees, 42 per cent from front. In present case the c. of p. would be about 40 per cent from front, or 2.8 feet. For 10 degrees angle c. of p. would be about one-third back.

BISSELL HAS NEW MOTOR

Pittsburg, Pa., Dec. 3, 1910.

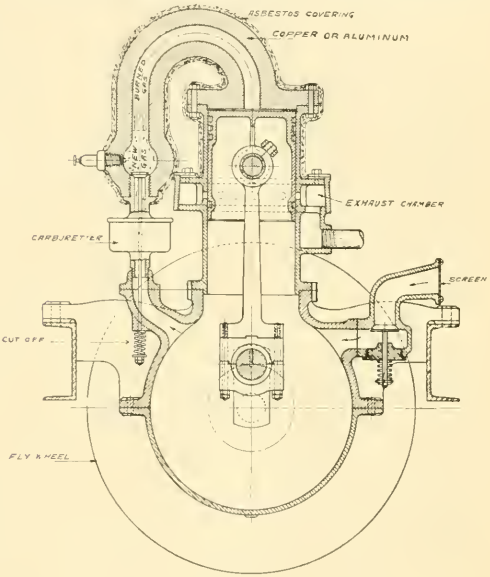
To the Editor of **Aeronautics**,
New York City:

I am sending under separate cover tracing of a new 2-cycle gasoline motor, which please return at your earliest convenience. It's an Ocean Crosser!

As a whole magazine full of words would be required were one compelled to drag out all the reasons in detail why this arrangement actually will perform its functions as claimed, it seems reasonable to assume your readers are more or less familiar with the theory of heat engines—so if we "fire her off" by bawling out both long and loud the fact that a foreign government, well up in such matters, actually did request not only complete details but the costivity thereof in face of recent motor improvements. Certainly a club, this, well calculated to mash flat the empty skulls of prejudice—good enough for a world power, good enough for aeropower—how's that?

It's a fact gas engines inhale a lot more fumes than can be economically assimilated. They are fed like the old style steam engines which were controlled by governors only, before cut offs came into vogue. This enormous waste not only costs like sin, but aeroplanes can't travel nearly so far as they should were the defect remedied, and worse still, they're obliged to grind over two extra cycles solely for seavenging purposes. As I recall the actual figures, out of a possible 80 per cent, at least 30 per cent is sacrificed, through conduction—12 in premature exhaust and 10 by muffler, or its alternative, a deafening roar. And as 10 per cent goes to friction, only a meagre 20 per cent remains for work, and that with but one efficient speed. Then consider induced friction, particularly in air-cooled motors, otherwise rivers of "castor"—and nearly every quart costs a whole H. P. to keep aloft? Water cooling adds both weight and complication—just think of it?

Now whet up your wits for a round with the graphic analysis—nothing but a cylinder, piston and big goose neck plus a small valve or so and carburetor. Were I to itemize what there is not it might become tedious. Only one quarter the amount of gasoline used here in comparison with other engines per H. P., mind you. How? Well, as stated above, water cooling or its equivalent absorbs over 30 per cent, premature exhaust 16 per cent, and muffler 10 per cent. Total 52 per cent. My engine hasn't any of these vampires to contend with—it doesn't need them—it expands the charge, as in a good steam engine, nearly to atmosphere and is only expected to cram the cylinder on special occasions, hence, there is no need for a muffler, for there is no noise to muffle? All the heat generated in combustion either drives the piston forward by expansion, or is sucked around the goose neck to keep the cylinder walls at the proper temperature, 300 degrees F., and is thereby practically exhausted.



Lubrication is easy because the working members are remote from excessive temperatures.

But here is another superb feature: i.e., the working charge can be varied at will without altering compression a single ounce, and owing to construction of combustion tube will remain segregated from the inert gases.

Any good heat conducting metal will serve for the "goose's neck"—aluminum for example—however, copper seems more appropriate for terrestrial applications.

With best wishes for the coming season, am

Yours very truly,

Box 795, Pittsburg, Pa. Jos. E. Bissell.

AERONAUTICAL PATENTS

Harry C. Gammeter, Collinwood, O. 968,931, Aug. 30, 1910. Filed Oct. 9, 1907. FLYING MACHINE of the orthopter type, the main characteristics of which are that the wings are provided with a stiffening bar at the front while the outer and rear edges are free from rigid restraint. Radiating ribs are covered with fabric in strips secured at their upper edges and forming valves.

John M. Biggs, Dayton, O. 968,834, Aug. 30, 1910. Filed June 28, 1909. AEROPLANE FLYING MACHINE. A series of planes have a car suspended therefrom, means being provided to tilt the planes from the car. Wheels and skids are provided, the former normally below and under stress of increased pressure or "undue weight" to move upwardly and bring the skids into operative position.

Gardner C. Luther, Providence, R. I. 969,643, Sept. 6, 1910. Filed June 14, 1910. CABLE PROPELLED AEROPLANE. An amusement device consisting of a supported aerial cable, power driven and endless, with means for securing gliders thereto.

Andrew A. Heil, St. Louis, Mo. 969,865. Sept. 13, 1910. Filed Oct. 5, 1909. AEROPLANE, the novelty of which resides in a box like frame containing the propelling means consisting of a spiral propeller encircling its shaft several times and increasing in diameter from its ends to the center. Wings or planes are pivotally mounted at the sides of the frame with means provided to adjust their inclination, and directing members are universally pivoted on the front and back sides.

Angust von Parsefal, Charlottenburg, Germany. 970,262. Sept. 13, 1910. Filed April 6, 1908. CONTROLLING DEVICE FOR AIRSHIP. This invention consists of a system of inlet and outlet valves with two or more airbags and an air chamber, to which they are connected by tubes that as air is supplied to one bag, the air contained in the other is permitted to escape.

Richard P. Marable, Yuma, Ariz. 970,842. Sept. 20, 1910. Filed Aug. 30, 1909. AERIAL NAVIGATION. A combined balloon and aeroplane. The cigar-shaped aluminum body is divided into separate gas compartments by bulkheads. Annular engine chambers are also provided for several engines acting independently on propellers arranged at different points around the body. A plurality of aerial planes extend longitudinally on each side of the body, and means are provided for independently adjusting the planes.

T. A. Edison, 970,616. Sept. 20, 1910. FLYING MACHINE. Already noticed in November **Aeronautics.**

John W. Wilson, Boston, Mass. 970,771. Sept. 20, 1910. Filed Jan. 2, 1908. FLYING MACHINE, more specifically an aeroplane. Two frames one above the other bear respectively the seat and driving wheels below and a plurality of planes above. These frames are flexibly connected to allow longitudinal movement of the upper frame as well as a tilting movement. The propellers are mounted above the planes and are connected to the driving power with the wheels on the lower frame, so as to be rotated jointly.

Peter Robert Torbrand, Denver, Colo. 970,974. Sept. 20, 1910. Filed Feb. 25, 1910. FLYING MACHINE. Stabilizing device for aeroplanes by means of pendulum. The frame structure is provided fore and aft with horizontal and vertical rudders respectively, and at the sides are lateral balancing planes. The pendulum is operatively connected to all indirectly in such manner that any motion of the pendulum will impart motion to one or more of these devices according to the direction of swing or tilt.

Wm. H. Fauber, Nanterre, France. 971,030. Sept. 27, 1910. Filed Oct. 24, 1908. AEROPLANE, consisting of a central longitudinal arched plane member with lateral plane members extending at the sides, one at the rear of the other, with the forward edges above the level of their rear edges, and having the rear portions downwardly curved. The planes are collapsible.

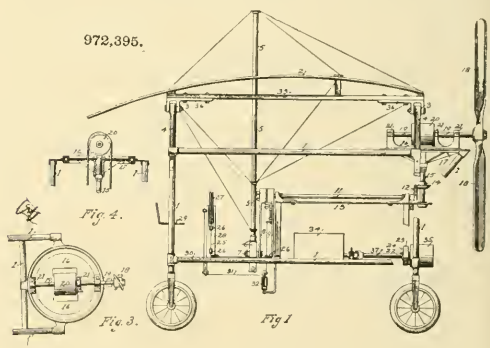
Maurice Ackerman, Washington, D. C. 971,235. Sept. 27, 1910. Filed Sept. 21, 1909. FLYING MACHINE, more specifically an aeroplane. Construction embodies two superposed planes movable in parallelism with relation to each other. A rearwardly extending cage containing the motor and propeller mechanism is mounted on the planes through a universal joint connection, and at the front a frame similarly mounted carries rudder mechanism. Means are provided for turning the rear cage and forward frame simultaneously in opposite directions.

Leonard E. Clawson, San Francisco, Cal. 971,358. Sept. 27, 1910. Filed Nov. 5, 1908. AERIAL MACHINE, the characteristic features of which consist of oscillating wings, propeller and guiding rudders operated by oscillating liquid containing transmitters actuated by motors which in turn are set in motion by hand and foot operated levers. The several motors are capable of operation by the weight and manual power of a single person.

Hermann Hartmann and Wilhelm Klehe, New York, N. Y. 971,535. Oct. 4, 1910. Filed Dec. 4, 1909. AEROPLANE, comprising a single plane at the front and a pair of biplanes at the rear extending at the sides of a central frame to which they are so mounted that they may be tilted. The biplanes converge at the rear, while at their forward edges they extend to the same width with the rigid single plane.

John Emery Harriman, Jr., Brookline, Mass. 972,448. Oct. 11, 1910. Filed Feb. 8, 1904. FLYING MACHINE of the aeroplane type. A plurality of wings composed of superposed planes are secured together at their inner and outer extremities, and made collapsible at will of the operator. The wings are pivoted together and a support for the operator is suspended therefrom.

Sylvanus S. Morrison, Newport, Ky., assignor of 9-20ths to Walter I. Buckman, Covington, Ky. 972,395. Oct. 11, 1910. Filed April 6, 1910. AUTOMATIC BALANCING MECHANISM in flying machines. A supporting surface such as a plane is



provided with an operating mast extending down to the suspended car. A propeller is mounted on a turn table so connected to the mast that upon a certain extent of swing the turn table is swung by the mast and the thrust of the propeller will right the apparatus.

Rocko T. Savino, New York, N. Y. 973,389. Oct. 18, 1910. Filed Feb. 5, 1910. FLYING MACHINE, more specifically an airship or dirigible balloon, the characteristic construction of which resides in the suspended frame being slidably connected with the bag so as to be adjustable at different elevations therefrom. The frame is provided with lifting and propelling screws and also with oscillating wings.

Vincent C. De Yharrondo, Los Angeles, Cal. 973,398. Oct. 18, 1910. Filed June 14, 1909. CAPTIVE AIRSHIP MECHANISM. An airship carousel driven by screws mounted on the ships. Means of the nature of planes are provided for varying the course of travel, which, however, is limited, since the ships are suspended from cross bars as usual in carousels.

John M. Davis, McGraw, N. Y., assignor of one-half to Clarence H. Metzler, Binghamton, N. Y. 973,632. Oct. 25, 1910. Filed Jan. 31, 1910. AEROPLANE of the biplane type with planes having forwardly convergent sides, flat front ends and gradually increasing cross-sectional curvature towards rear ends. A tilt plane is provided at front end of upper plane, while at rear a rudder is mounted and on its top a shield is provided curved transversely to correspond with the rear end portion of upper plane.

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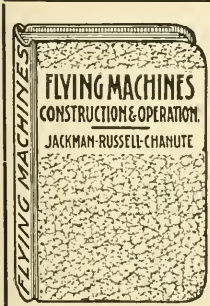

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1911

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The Wanzer 1911 model monoplane comes forward with the following claims:

That it is steel framed—twin screw—gravity and thrust balanced—pneumatic folding, starting and stopping device, carries a car for the protection of crew and passengers and this car is warmed by aluminum tubes which cool the engines by the circulation of water.

Power is furnished by two or more engines so attached to the drive shaft that the stoppage of one does not interfere with the work of the other. A start can be made from any surface that will permit the car to stand upright, and which is not obstructed by buildings or trees.

Built in two sizes, two and five thousand sq. ft., surface measure.

This Craft is not an Infringement and is fully Protected by Patents

FULL PARTICULARS ON APPLICATION

Orders for next season will now be accepted

C. M. WANZER, Urbana, Ohio

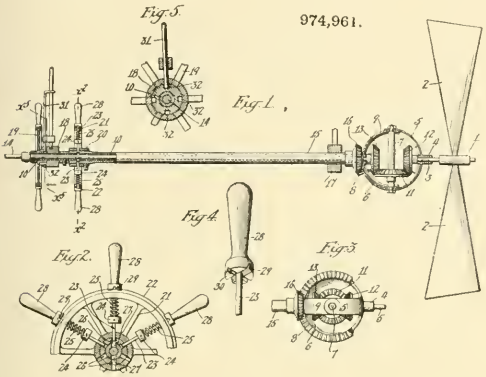
Patents

STEERING MECHANISM FOR FLYING MACHINES, 974,229, Nov. 1, 1910, filed May 1, 1909, Carl Bostel, Cleveland, O. Combination of a frame, a shaft rotatably mounted therein, steering planes hinged at each end of shafts, arms pivotally secured to free ends of planes, sliding blocks arranged within said shaft, means connecting arms and blocks, bars connected to blocks and provided at free ends with racks, a gear wheel mounted in shaft and adapted to mesh with racks on rods and means for rotating gear wheel.

PROPELLER WHEEL, 974,344, Nov. 1, 1910, filed Jan. 5, 1909, James Bennett, San Francisco, Cal. Revolving wheel with vanes mounted on what might be termed spokes of the wheel, said spokes, or spindles revolving independently, allowing vanes to turn through one-fourth revolution, so that they present maximum resistance to wind at one portion of revolution of wheel and least at another.

SKELETON FOR BALLOON OR AIRSHIP COVERINGS, 974,434, Nov. 1, 1910, filed Aug. 14, 1909, Wilhelm Rettig, Berlin, Germany. Wooden skeleton frame inclosing gas bags, so arranged and connected that they form a continuous reticulated convex body with intervening triangular meshes.

974,961.



BLADE FEATHERING MECHANISM, 974,490, Nov. 1, 1910, filed Feb. 21, 1908, Hugo Huckel, Neutitschein, Austria-Hungary.

FLYING MACHINE, 974,554, Nov. 1, 1910, filed Dec. 10, 1909, Louis L. Crane, of New York. Similar to a box kite, having one of the sections thereof pivotal while the other section is provided with rudders or steering wings, and with a motor and propeller.

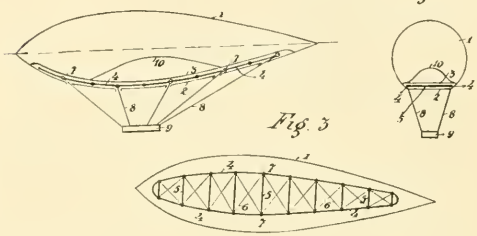
TOY PARACHUTE, 974,733, Nov. 1, 1910, filed Nov. 6, 1908, Maurice E. Wright, San Diego, Cal. Monoplane type, three following main planes, with a pair of feathering multiple bladed propellers on each side rotating in a vertical plane.

GEARING FOR PROPELLERS, 974,961, Nov. 8, 1910, filed Mar. 29, 1909, William A. Hall, Los Angeles, Cal. Propeller gearing to provide means for adjusting propeller so that it will rotate in any plane above or below the center line of drive while the propeller is in motion.

AERIAL TOY, 975,182, Nov. 8, 1910, filed July 29, 1909, Zoe D. Underhill, Bedford Station, New York.

APPARATUS FOR TESTING FLYING MACHINES AND LEARNING ART OF AVIATION, 975,196, Nov. 8, 1910, filed Oct. 11, 1909, Richard Alexander-Katz, Berlin, Germany. Provides a traveling, suspensory support for aviator and his machine, comprising an aerial track from which flying machine is rotatably suspended from one end of a rope, the other end of which is attached to a suitable counterweight.

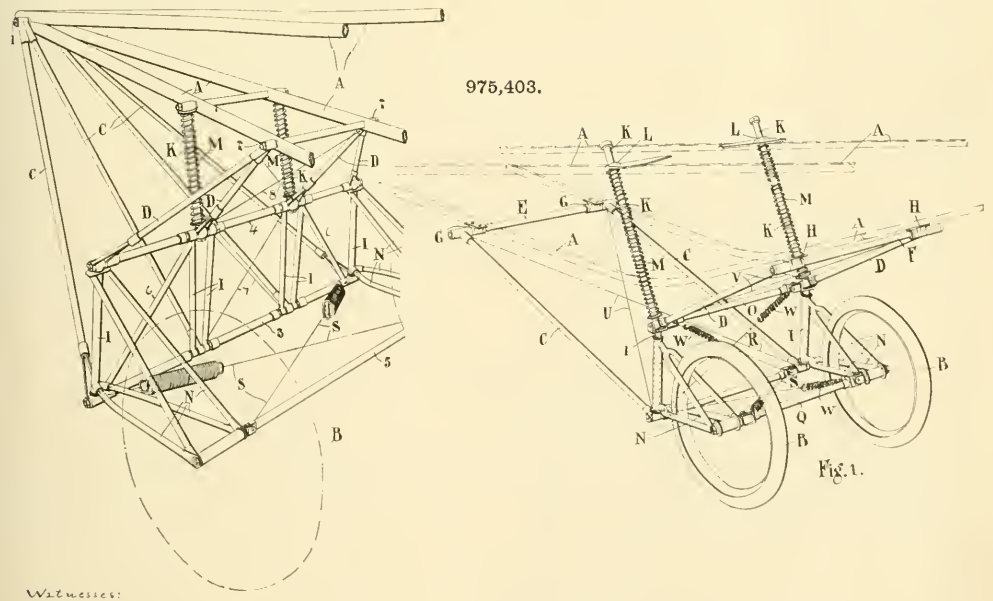
975,330.



FLYING MACHINE, 975,229, Nov. 8, 1910, filed Nov. 22, 1909, Roscoe C. Gore, Tecumseh, Neb. Flapping wing device.

INFLATED AEROPLANE, Nov. 8, 1910, filed Aug. 7, 1909, Arthur E. Maiden, Fort Lee, N. J. Aeroplane with hollow wings to be filled with hydrogen gas.

975,403.



LIFE SAVING DEVICE, 975,281, Nov. 8, 1910, filed Apr. 29, 1910, John J. Rectenwald, Mt. Oliver Borough, Pa. Parachute device with means for propulsion if landing made in water and means for carrying supplies in floating medium.

TOY, 975,291, Nov. 8, 1910, filed Dec. 28, 1909, John Schramm, Chicago, Ill.

CAR SUSPENSION FOR AIRSHIPS, 975,330, Nov. 8, 1910, G. A. Crocco and O. Ricaldoni, Rome, Italy, filed Mar. 27, 1909. Device for the suspension of short cars to long gas bags. Suspension of car to longitudinal beam in interior of bag. Beam rests freely on bottom of same so that the tissue is not hindered from contracting or expanding.

SHOCK ABSORBING DEVICE FOR AEROPLANES, 975,403, Nov. 15, 1910, filed June 20, 1910, J. W. Dunne, London, England, assignor to Blair Atholl Aeroplane Syndicate, Ltd. Single or double system of supporting rods and springs or other shock absorbers, each system comprising, when viewed in side elevation, radius rods pivoted to the body of aeroplane at points fore and aft and to the lower and upper ends respectively of a rod or frame carrying the wheels or other support together with a spring connection between the upper end of said rod or frame and a central support on the body of the aeroplane; also, comprising a double system under frame, with a pair of wheels or other supports as above having universally jointed rods and spring cross connections connecting the right hand and left hand systems.

AERIAL PROJECTING APPARATUS, 975,953, Nov. 15, 1910, filed March 5, 1910, Iskander Hourwich, Washington, D. C. Collapsible or knockdown device for launching at varied and controlled speeds.

FLYING MACHINE, 976,161 Nov. 22, 1910, filed Aug. 4, 1909, Silas H. French, Oberlin, O. Propeller adapted to co-operate with planes to combine advantages of both the aeroplane and helicopter, with means for controlling direction of flight and maintaining equilibrium by means of feathering propeller blades.

MILITARY AERONAUTICS IN AMERICA

THE report of Brigadier General James Allen, chief signal officer of the army, to the secretary of war, dated 1910, contains a short résumé of progress in aviation and aerostatics during the past year and considers the importance of aeronautics in connection with the United States Army.

From United States Consular reports and other available sources of information, it is estimated that Germany at present possesses 14 military dirigible airships and five aeroplanes; France, seven military dirigible and 29 aeroplanes, and these numbers are being rapidly increased by liberal appropriations.

MILITARY AIRMANSHIP

"The Signal Corps at present has but one lieutenant and nine enlisted men on duty in connection with aeronautics, and until the Signal Corps is increased by suitable legislation it will be impossible to furnish more officers and men for the absolutely necessary training demanded in airmanship. There is now but one officer of the Signal Corps who is a licensed pilot for free balloons. At a low estimate, it is believed that at least twenty aeroplanes should be in the service of the United States on regular practice at different points of the country throughout the year and present at the camps of instruction for regular troops and organized militia. This estimate is considered extremely low and would provide but two aeroplanes for each camp of instruction. To operate this number of aeroplanes would require at least 20 specially trained officers as pilots. In addition to this, each machine must carry at least one observer, which, experience has shown, will require much training and actual practice before the usefulness of the aeroplane is attained. The new Field Service Regulations, 1910, provide for aeronautical companies of the Signal Corps fully equipped with suitable aeronautical devices for service with the mobile forces. At present not even a model of such a company could possibly be organized, nor will it be possible to do so until the Signal Corps is increased by suitable legislation.

AERONAUTICAL TESTS AND RESEARCH

"Realizing the importance of aeronautics, Great Britain has recently appointed an advisory committee for aeronautics, with the Right Honorable Lord Rayleigh as president and nine other gentlemen eminent in the military, naval, and physical sciences as associates. This committee has submitted an interim report, which has been printed for Parliament and outlines a thorough and systematic programme for the theoretical and experimental investigations in aerostatics and aerodynamics as bearing on the important problems constantly arising in aerial navigation. The National Physical Laboratory, which corresponds to the United States Bureau of Standards, has been provided with special buildings and apparatus suitable for undertaking various kinds of aeronautical experiments and tests under the direction of the Government to encourage in every possible way the advance of this new science in Great Britain.

"In Germany the University of Gottingen has for a number of years given special attention to aerodynamical experiments in a specially constructed and well-endowed laboratory, and it is understood that in the latest designs of dirigible airships for the German Government valuable assistance has been received from the study of models in this laboratory.

"In France the University of Paris has recently been richly endowed and provisions made for carrying forward similar experimental work for the citizens of the French Republic.

"In Russia one of the best equipped aerodynamical laboratories in the world has been founded near Moscow.

"In addition to this, aerial navigation has become the subject of special instruction at various universities in Europe.

"It is evident that the United States should, without delay, make due provision for carrying on similar work for the various government departments interested, and to assist the large number of American inventors and manufacturers at present devoting themselves to the problems of aerial navigation.

"Aerial navigation has taken hold of the entire civilized world as no other subject in recent times, and represents a movement that no forces can possibly check.

"In its military aspects it is a subject which we must seriously consider, whether we wish to or not, and the sooner this fact is acknowledged and measures taken to put us abreast with other nations the better it will be for our national defense."

AEROPLANE RADIATORS
IN STOCK OR TO ORDER
EL ARCO RADIATOR CO.
6 EAST 31st STREET
NEW YORK

THE LIFE AND WORK OF OCTAVE CHANUTE

(Continued from page 3)

The papers read at and contributed to the Conference fill a volume of more than four hundred pages. The authors were men of acknowledged merit in various parts of the world. The attendance averaged about one hundred at each session.

In the summer of 1896 Mr. Chanute began his now well-known experiments on the sand-dunes with man-carrying gliders. These were continued in the following year. The accounts of this very important part of his work have been fully given in various magazines and pamphlets.

Beginning with the glider of the form which had been used by the German Lilienthal, two years of study and experiment enabled him to produce a type having great superiority in the matter of stability and efficiency.

For many years Mr. Chanute was in regular communication, personally and by correspondence, with all the men he could find who were intelligently trying to do research work in aviation. The help which he gave to such men can never be fully known or measured.

The counsel and encouragement which he gave to Wilbur and Orville Wright have been gratefully and gracefully acknowledged by them. It is all a matter of history. It came to them at the time when it was most needed, when they were at the foot of the steepest part of the unblazed trail. It gave them the courage and confidence which were essential to enable them to keep on alone and to emerge at last at the summit, triumphant.

Mr. Chanute died in Chicago on the 23d of November. Three daughters and one son survive him.

Those who knew him will always remember his lovable character and will think of the oft-repeated saying, "He was more willing to give credit to others than to claim any for himself."

We may well believe that whenever in the future the history of aviation shall be reviewed, the name Chanute will stand forth as that of one of the few great founders.

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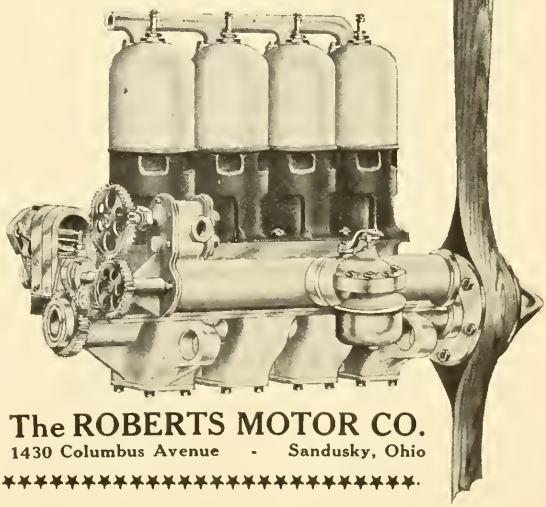
THE weight given includes everything shown, except the propeller. Propeller and radiator furnished with motor. This is a motor absolutely free from freak ideas and gives its rated H.P. at 1,000 r.p.m. The only two-cycle guaranteed free from base explosions. Long bearings, large crankshaft, Bosch magneto, free from vibration, and a motor that will run for any length of time without missing or overheating of bearings.



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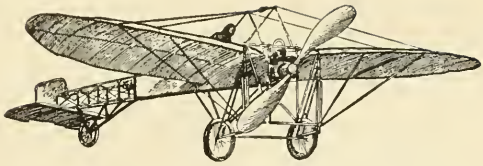

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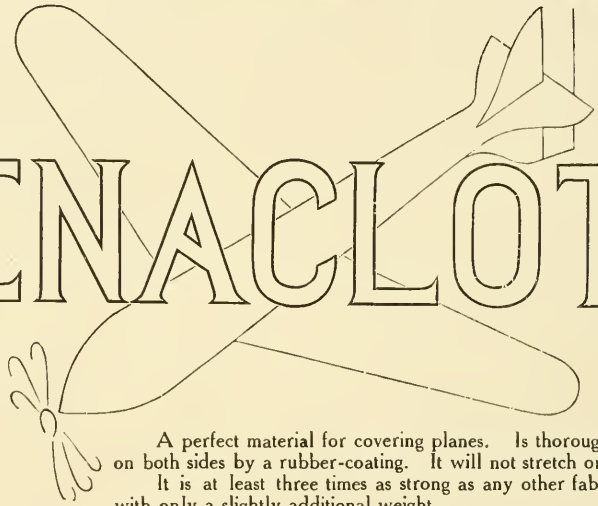

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A covering of Penacloth gives added strength to the whole structure.

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IN THE AERIAL MARKET PLACE

TO OUR FRIENDS—We would appreciate it very much if you would specify in writing advertisers that you saw the ad. in AERONAUTICS. This will help us, and eventually be of equal service to yourselves.

The Sellers Aeroplane

It is likely that R. O. Rubel, Jr., & Co., of Louisville, Ky., will shortly arrange with M. B. Sellers to market his quadroplane. The last month four Detroit Aeroplane Co. motors were sold to: Chas. Wickliffe, of Louisville; W. W. Tranah, Shawnee, Okla.; W. F. Morehead, Guerdon, Ark.; Frank Bean, Sacramento, Cal. A biplane is being delivered to the editor of the "Daily Telegram," of Temple, Tex.

Simms Motor Starter

A novelty placed upon the market this year by the Simms Magneto Co. is the Simms motor starter. This entirely new device has been exhibited for the first time at the last Olympia Show in London, and has attracted everybody's attention. This system consists of the usual high tension magneto and of a neat brass switch mounted convenient for the user. When the switch is in the "on" position, a small trembler begins to operate and allows the battery current to flow through the primary winding of the magneto. The high tension current generated in the secondary winding of the magneto armature is then distributed in the usual way to the cylinder, which is filled with explosive mixture. As soon as the motor has reached a certain speed the battery circuit is interrupted and the magneto comes into operation. This system is remarkable for its great simplicity. It has the advantage of the so-called dual ignition system, namely, starting the motor from the seat, but none of the disadvantages, such as high tension connections, high tension switch or separate coil. Only one set of sparking plugs is used. This will be shown at the Madison Square Garden, January 7-21, and in Chicago, January 28-February 11, shows.

The Simms distributors for 2-8 cylinder motors will also be displayed. They may be used either in conjunction with a magneto or batteries. They are designed and made on magneto lines. The vital parts of Simms distributors, such as contact breaker and high tension distributor arm, are actually standard magneto parts. They, therefore, embody all the advantages of the construction of the magneto.

There will also be shown various special Simms magnetos for aeroplane motors.

1911 Elbridge Motors

The Elbridge Company, at Rochester, expects to double its business the coming year. The new 4-cylinder engine weighs 154 pounds, without magneto, but otherwise complete. It maintained on the block 57.8 h.p. for half an hour, under the servation of Arthur P. Homer, a naval architect of Boston, who has taken the New England agency. Since then, the company states, it has run a 4-cylinder engine for 10 hours at 1,200 r.p.m. under full load, throttle wide open, spark fully advanced, and not the slightest adjustment was made from the time the engine was put on the block until it was taken off. We only made the run to satisfy ourselves that a man could reasonably expect to meet every existing duration record with one of these stock engines. There was not the slightest deterioration in power nor the least sign of wear in bearings or any other part of engine.

Longfellow Monoplane

A Bleriot type monoplane is being put on the market by the Longfellow Monoplane Co., of Boston, Mass. Following are the details:

The machine has a sustaining surface of 160 square feet; fusilage, oval steel tubing, selected hickory and spruce; lateral stabilizer and interchangeable parts. The length over all is 24 feet, and spreads 26 feet. Control is universal with horizontal wheel for warping and elevating. A 7-foot laminated propeller with 250 pounds thrust is used. The running gear is of Shelby steel tubing, bridge construction. The wings of the machine are made of spruce, laminated trussing, quick detachable. A 30-h.p., 2-cylinder opposed, 2-cycle revolving motor with a Bosch high tension magneto has been installed. A speed of 50 miles an hour is claimed. Net weight is 450 pounds. Price complete, $1,800 f.o.b. Boston.

Rations for Balloonists

In connection with the recent trying experiences of Hawley and Post in getting to civilization after landing with the balloon "America II.", and the other aeronauts who had exciting experiences without adequate rations for a prolonged march, the chocolate preparation devised by Powell's, 415 Canal St., New York, ought to come in for a share of attention.

A composition of chocolate, sugar, egg and malted milk, not in the least too sweet, is incased in a sealed tin packet weighing just 11 oz. This contains enough nourishment to sustain in perfect physical condition an average man for 24 hours. It is the same as is now being manufactured for the U. S. Army and can be supplied to the public as well. The ration itself weighs 8 oz. and can be eaten either dry or made into a beverage. A half dozen of these, which can easily be carried in one's pockets, would last a week and the danger of succumbing to extreme hunger be avoided. A sample can be had by addressing as above.

The exact composition of the Powell ration on which General Fred Grant, Commander of the Army of the East, lived for three days, is as follows: Chocolate liquor, 47.17 per cent; nucleocasein, 6.88; malted milk, 6.88; dessicated eggs, 20.64; sugar, 13.76; cocoa butter, 3.66; moisture (not over), 3.62 per cent.

Fox De Luxe Motors

The Dean Mfg. Co., of Newport, Ky., has issued its 1911 catalogue of Fox De Luxe two-cycle engines. Five different aero motors are priced, as follows: 24-36 h.p., 4-cyl.; 36-48 h.p., 6-cyl.; 60-80 h.p., 4-cyl.; 90-120 h.p. 6-cyl.; and 80-100 h.p., 4-cyl. The first two have cylinders 3½ x 3½, the next two, 4¾ x 4¼, and the other 5½ x 5, with weights running 150, 200, 300, 450 and 400 pounds respectively. Prices are: $1,000, $1,500, $2,000, $3,400 and $3,000. These include radiator, fan, water pump and Bosch high tension magneto, gear driven.

DETAILS OF PARTS

In all sizes and types of Fox Motors there are certain general features that are similar. The distinctive features of each type are described later.

The **Cylinder and Cylinder Head** are cast together, in one piece, of semi-steel, machined inside and out, with ample water jackets of spun brass held in place by a steel ring at base.

The spark plug is on top of the cylinder, where it is well cooled by water circulation. This insures long life to the spark plug. On the side of the cylinder are two cocks, the lower one to draw off the water from the water jacket in cold weather; the upper one is a compression relief cock to relieve half of the compression in the cylinder, so that the engine can be started under half compression, making it easier to turn over.

The **Crank Shafts** used in Fox Motors are of special design, with long main bearings and exceptionally long wrists and connecting rod bearings. All bearings are ground and have liberal fillets in the corners.

The **Crank Case** of all Fox Motors is a single aluminum casting, reinforced with steel rods. The upper half of the crank case is made separate of aluminum. These parts are cast in our own shops, for we operate our own foundry for close gray iron castings and semi-steel. We also have our own brass foundry and make our own aluminum castings.

The **Piston** is cast with a deflector plate attached. It is accurately machined and fitted with elliptical ground rings which retain the compression.

The **Connecting Rod** is also designed with long bearings, which are scraped to a perfect fit. This is one of the most important parts of any motor and only the best material and workmanship will insure a connecting rod that will not wear in the bearings. Our wrist bearings are large and the company guarantees they will not need readjustment for at least a year.

The **Shaft Bearings** are long, babbitted with high-grade babbitt metal and reamed and scraped to a perfect surface.

Pump and Water Circulation.—The pump is of the plunger type, direct acting, with the check valves a part of the pump casting; it is driven by an eccentric on the crank shaft. The plunger is long, so as to provide ample bearing, insuring long life. It throws a heavy stream of water, which is piped first to the exhaust manifold and thence carefully distributed to all of the cylinders, so as to maintain an equal temperature.

Lubrication.—Thorough oiling is essential to the satisfactory operation of any motor, and each and every working surface must have its proper supply. To provide for this, Fox motors are variously equipped, depending upon the class of work and the conditions under which the motor will be operated.

The **Carburetor** is especially adapted to two-cycle motors. By allowing the amount of air passing the needle valve to remain constant at all times and throttling the charge after it is mixed, it is claimed practically impossible to make Fox motors back-fire and they guarantee more variation in speeds, greater economy and efficiency with the Fox carburetor on any two-cycle motor than is possible from any other carburetor on the market.

New Goodyear Aero Department

After a year's deliberation and scientific experiments extending over the same period of time, the Goodyear Tire & Rubber Co., in Akron, O., have constructed an immense addition to their gigantic plant for the purpose of manufacturing a hundred or more different articles for use during the impending aerial age.

One department alone has been established simply for the marketing of aeroplane and balloon materials. Another is devoted solely to experiments.

For the past six months four Goodyear experts have been scouring Europe for new aviation knowledge and their findings are echoed in the new industry.

One discovery, the importance of which will be felt generally within a year or so, is that of a new fabric for covering aeroplanes and aerial vehicles. This is a rubber coated cloth, permanently waterproof. Aviators have complained of the fact that plain fabrics, dampened by contact with the clouds, ended the rigidity of the wings and consequently placed the occupant of the machine in danger from the possible collapse of the frame work.

Tires are now being manufactured in large quantities, their construction being similar to the famous Goodyear automobile tires. Piano wire tape in the base makes it impossible for the tire to tear loose when the aeroplane lands. The new tire is of the detachable type.

Willis Co. Will Exhibit at Boston

The E. J. Willis Co., 85 Chambers St., New York, who were pioneers in the bicycle, automobile and motor boat supply business, and who have been carrying a full line of aeronautical supplies for the past year and a half, will exhibit a full line of motors, propellers, radiators and fittings at the Boston Aero Show, February 20-25. Their exhibit will be in charge of Mr. Walter Shulman, who is an enthusiast in the sport-science of aviation.

The Willis Co., being manufacturers, are in a position to cater to the wants of the aviator, and during the last year have introduced many fittings absolutely necessary in the construction of aerial craft. The Willis Co. have been doing an extensive business in this line throughout the United States, Canada and Mexico, but have not halted there, but have sold trade in foreign countries, and report that the results have surpassed their expectations. A new catalogue has just been edited which will be sent free to anyone interested

The Kirkham-Eells Co. of Bath, N. Y., is building a new 6 cylinder 4 cycle aero engine 4½ x 4¾, to weight 235 pounds, and give approximately 50 h.p. at 1,350 rpm. Another higher powered engine will also be built.

INDEX TO VOLUME VII

Note.—Volume I started with the first issue, that of July 1907. Volume II started with the issue of January, 1908. Volume III started with the July, 1908 issue. Volume IV started with the January 1909 number, and Volume V with the July, 1909 number. Volume VI started with the January, 1910 issue, and Volume VII started with the July, 1910 number.

Owing to a lack of space, it is absolutely impossible to index all the flights of aeroplanes, the balloon ascensions, news and trade items, the monthly review of affairs abroad, etc. The following list barely covers the principles articles.

JULY, 1910

	Page
Gliding as a Sport, by Hiram Percy Maxim..	1
Can a Man Fly with Wings, by Prof. H. LaV. Twining	2
New Prizes (World-Post Dispatch, N. Y. Times-Chicago Post, Edwin Gould, Evening World, Scientific American)	4
How to Make a Propeller	5
Curtiss Wins $10,000 Prize in Albany-New York Flight	7
Hamilton Flies to Philadelphia	10
Wright Students Complete Training	11
Mineola Flights	12
The Loose Monoplane, by Cleve T. Shaffer	16
Flying in Mexico, by E. L. Ramsey	17
Affiliated Clubs Revolt; New National Body Organizes	20
Wright Injunction Vacated	21
Lamson vs. Wright Suit	21
Record Kite Flight	22
Army News	22
Foreign Letter, by Greely S. Curtis	23
Club News	25
Exchanges and Forum	26
The Buyers' Guide (Detroit Aeroplane Co. motor and the Whitehead motor)	28
Patent List	30
Ascensions	33
J. W. Dunne's Automatic Stability Device	36

AUGUST, 1910

Paradoxes of the Air, by C. W. Howell, Jr.	37
Stephens Stability Control	38
Can a Man Fly with Wings, by Prof. H. La V. Twining	39
The World's Record Altitude Flight, by W. R. Brookins	41
Humidity and Flight, by Dr. A. F. Zahm	41
Brookins' World Altitude Record at Indianapolis	42
Brookins' World Altitude Record at Atlantic City	44
Montreal Meet	45
Army News	48
Harmon Sets New U. S. Record, Flying at Mineola	50
Construction Aids—XIV	51
National Council of the Aero Club of America Formed	52
Second Annual Aero Show of the Pacific Aero Club, by Cleve T. Shaffer	53
Foreign Happenings	55
The New Farman Monoplane	57
Aviation Treaty Between Mexico and the United States	58
Rules for Chicago-New York Flight	58
Rules for Gould $15,000 Prize	59
The Wright Suits	60
The Buyers' Guide (Call Engine, U. & H. Magneto	62
Club News	69
Exchange and Forum	70
Ascensions	73

SEPTEMBER, 1910

Proving Horsepower by Reaction, by C. H. Inman	77
Construction Aids—XV	81
Aeroplanes and Balloons in Mexico, by E. L. Ramsey	83
The Wiseman-Peters Biplane, by Cleve T. Shaffer	84
The Stevens Monoplane, by Chas. E. Schmerber	86
At the Los Angeles Aerodrome, by Prof. H. La V. Twining	87
Meets—Asbury Park, Omaha, Toronto, St. Louis, etc.	88
New Curtiss and Baldwin Aeroplanes	92-96
Walden Aeroplane	96

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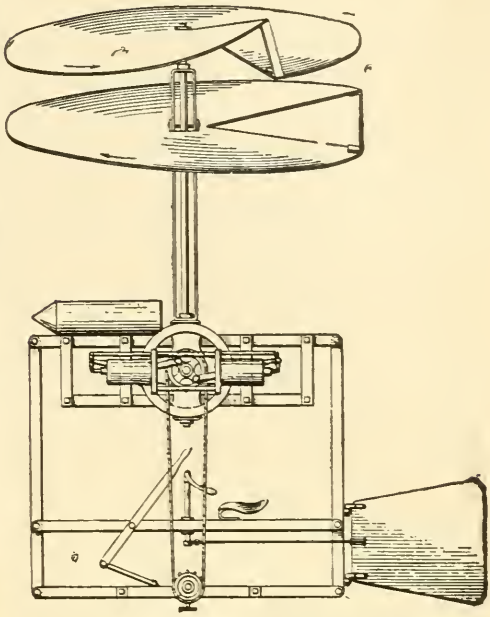

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Patents 98
Burgess Aeroplane 99
In the Aerial Market Place (Detroit Aero Construction Co. Engine, the Hall-Scott and Detroit Rotary) 100
Subscribers' Exchange and Forum 104
Foreign Letter (Le Blanc Wins 485 Mile Race) 107
Ascensions 109
Club News 109

OCTOBER, 1910

An American Balloon Trip Over Rome, by Rufus G. Wells 111
Propeller Design and Construction, by Spencer Heath 112
The Make-up of a Bird's Wing, by Dr. A. S. Rowe 113
Harvard-Boston Meeting, by Greely S. Curtis.. 115
Perkins' Man-Carrying Kite 118
Curtiss Flies 129½ Miles Over Water..... 119
Harmon Crosses Sound 119
Late Wright Model..... 120
Selfridge Monument Erected 121
New Greene Biplane 121
At the Mineola Aviation Grounds (Frisbie Machine) 122
Flying Out on the Pacific Coast, by Cleve T. Shaffer (D. H. Gordon Machine)..... 125
Flying at Los Angeles, by Prof. H. La V. Twining 126
Incorporations 126
Asbury Park Meet Concluded 127
Sheepshead Bay Meet 128
Wireless on Aeroplane, by Capt. Geo. A. Wieczorek, U.S.A. 129
Chicago-New York Race 130
Lamson Suit 132
National Council of A. C. A. Issues By-Laws.. 132
The Latest Gill Biplane 133
Wellman Airship 134
Patents 134
Trade Notes (Anzani Motor) 136
A Simple Way to Draw a Parabolic Curve.... 138
Subscribers' Exchange and Forum..... 139
Foreign Letter 141
Thrilling Night Balloon Trip, by Dr. Thomas E. Eldridge 143
Ascensions 144
Club News 144

NOVEMBER, 1910

Aeronautics and War, by Lieut.-Col. W. A. Glassford 145
Aeronautics in the Argentine, by Henry Helm Clayton 147
Aeroplanes Flying in Mexico, by E. L. Ramsey 148
Wing Sections, Principal Aeroplanes..... 149
Notes on Framing of Aeroplanes, by O. Ursinus, C.E. 150
The Eteve Automatic Stabilizer, by D. R. Hobart 151
The Pressey Automatic Control..... 152
Letter to Aero Club Members..... 153
Construction Aids—XVI 154
The Missing Link in Aeronautics, by John D. Pursell 155
Belmont International Meet 158
Exhibition Flights Over the Country..... 159
Hoxsey and Brookins Set New Marks..... 161
Stebbins-Geynet Aeroplane 162
Hugh L. Willoughby Flights..... 163
Hamilton Aeroplane and Engine..... 164
H. W. Gill Biplane 165
M. B. Sellers Quadroplane 165-166
Orville Wright Flies Over Dayton..... 166
William E. Somerville Aeroplane..... 166
Gordon Bennett Balloon Race 168
Elimination Balloon Race 168
The Weather Map, by Dr. A. J. Henry..... 170
British Fabric Testing Device, by T. O'B. Hubbard 170
Flying on the Coast, by Cleve T. Shaffer (DeBerry, Ivy Baldwin, Roehrig, Loose Machines) 171-172
Flights at Los Angeles, by Prof. H. La V. Twining 173
Mineola Aviation Grounds Flying 174
Hearst Prize 175
Roberts, Fox, Herman and Smalley Motors..176-177
Patents 178
Foreign Letter 180
Trade Notes 181

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DECEMBER, 1910

Aeronautics and War, by Lieut.-Col. W. A. Glassford 189
The Aeroplane Engine for 1911, by Antony H. Jannus 190
Notes on New Wright Machines..... 192
Parmalee Flies Dayton to Columbus and Hoxsey Flight 193
Ely Flies from Warship..... 195
At the Mineola Field, by J. Suche..... 197
News on the Pacific Coast, by Cleve T. Shaffer (Wisemann-Peters II Machine) 198
The Voyage of the "America," by Melvin Vaniman 199
Belmont Aviation Meet 200-207
Curtiss Monoplane 206
Baltimore Aviation Meet 208
Los Angeles Novice Meet (Walsh, Slavin, Roehrig), by Prof. H. La V. Twining.... 209
Death of Ralph Johnstone 210
Minor Meets and Exhibitions 210
Death of O. Chanute 211
List of Fatalities with Power Machines..... 213
Gordon Bennett Balloon Race Results..... 216
Ascensions 218
Philadelphia Aero Show ("Miss Detroit" Monoplane, Call Engine) 219
Exhibits at Belmont 220
St. Louis Aero Show 221
German Wright Patents Upheld..... 222
Wellman Transatlantic Trip..... 223
Aero Club of America Annual Meeting..... 224
Club News 224
Foreign News 226
Trade Notes (Details Rinek Engine) 227
Communications and Exchange 230

The Aero Show at Grand Central Palace set aside a special room for the use of the Aero Club of America and its members, without any charge, and so advised the Club. The president of the Club, Mr. A. A. Ryan, replied to the effect that as it was the Club's intention to give a show devoted exclusively to aeronautics to be held at a later date, it did not feel that it was in a position to take part in or "sanction" the aeronautical exhibition to be given in conjunction with the International Automobile Show.

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Next Bennett Race May Be Truly International

Following out the suggestions of **Aeronautics**, in the October number, the Aero Club of America, in sending its challenge for the 1911 Gordon Bennett, has asked the donor of the prize if it would be possible to restrict each club entering to the use of home-made machines. All the Bennett balloon races have been won by foreign-made balloons, and the 1910 Bennett aviation contest by a machine constructed elsewhere than in the country of its owner.

This is a step in the right direction and the club must be congratulated on realizing the importance of this matter, even at such a late date. For a long time **Aeronautics** has persistently urged this very thing in connection with the balloon race.

Ascensions

PITTSFIELD, MASS., Nov. 20.—J. J. Van Sleet, pilot; J. J. Van Valkenburgh, and Jay B. Benton, in the "Pittsfield," to Windsor Locks, Conn. Dur., 2 hrs.; Dist., about 50 miles. The start and landing was made at night.

St. Louis.—See special story.

Pittsfield.—See special story.

St. Louis Show Bankrupt

G. L. Holton, holding the title of "manager" of the recent St. Louis Aero Show, has filed a petition in bankruptcy, his assets being $7.54 and his clothes.

This show was held "under the auspices of the Aero Club of St. Louis," so advertised and held, and a circular letter to members of the club was sent out to this effect. Whether the club was to participate in the expected profits is not known, but it is now announced in plain black typewriting, on one side of a sheet of paper, by A. B. Lambert, the club's president, the "Aero Club of St. Louis had nothing to do with the indoor show at the Coliseum, other than to reserve space which we paid for."

The impression was given out that the club was running the show; certainly no attempt was ever made to disabuse the minds of those in aeronautic industries of such an idea. The club had ample time to disown any connection with the affair after the first published announcement of the show under its auspices.

The Aeronautical Society

All interested in the Art of Aviation should join the Aeronautical Society. Being the first organized body of its kind, and having accomplished more than any other association, it offers real benefits to its members. What was done from the day of its formation in July, 1908, to December, 1909, is described in a booklet which will be sent upon request. It is practically a history of aviation in the U. S. during that period. In the last year 50 machines have been built in the Society's shops at Garden City, L. I. Of these, 26 have actually flown over the Society's grounds. For further information and booklet address the ***Secretary, P. O. Box No. 28, Station D, New York City,*** or else ***No. 1999 Broadway,*** where weekly meetings are held.

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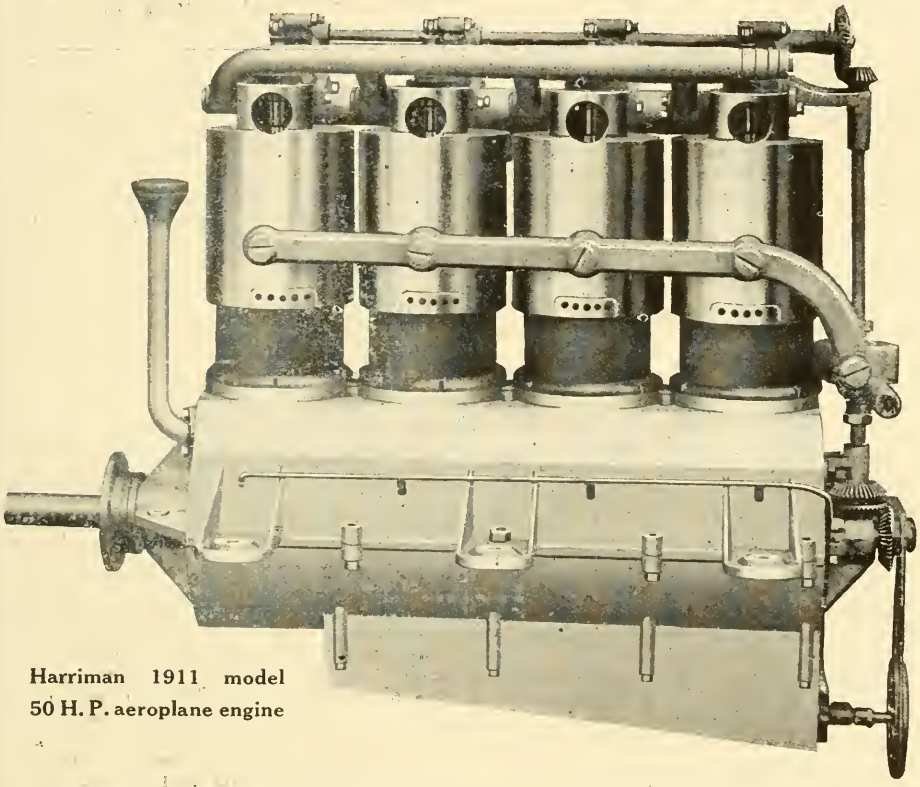

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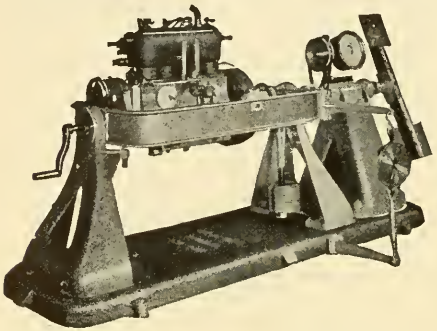

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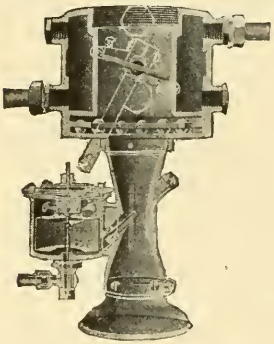

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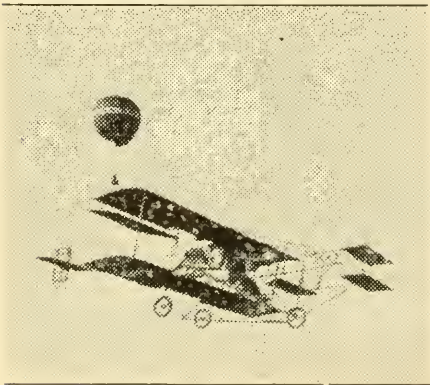

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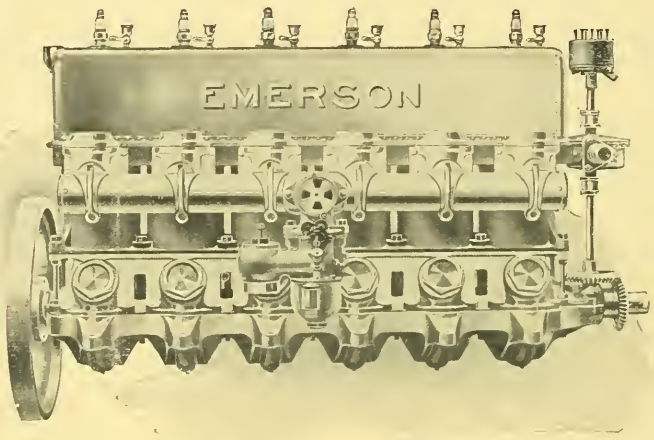

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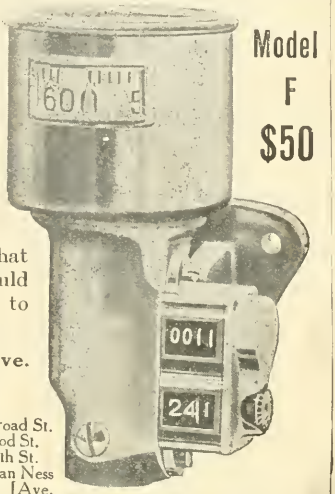

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HOW TO BUILD A CURTISS-TYPE BIPLANE

By G. H. Godley.

(Through the courtesy of the Editor of "American Motorist" we are enabled to print the first practical treatise on the actual construction of an aeroplane complete that has appeared in any aeronautical publication. Mr. Godley is an engineer on the staff of the above journal and is a member of the Aeronautical Society.—EDITOR.)

CONTRARY, no doubt, to the common belief, aeroplane construction has no very deep secrets, and the work is not difficult for a man who is fairly handy with carpenter's and machinist's tools. Doubtless there are thousands of amateur mechanics in this country who have both the skill and the tools, and with a capital of a few hundred dollars any one of them could build an aeroplane capable of making satisfactory flights. The series of articles of which this is the first will give the instructions, illustrated with working drawings, for the construction of a Curtiss-type biplane of 30-foot wing spread.

The time necessary to build an aeroplane on these lines depends of course on the skill of the workman, the help he gets from others, if any, and also on the amount of his capital; for much time can be saved by buying from supply houses small parts which would otherwise have to be made by hand. Turnbuckles, for instance, can be made from bicycle spokes and nipples and strips of sheet steel, or they can be bought for 12 or 15 cents each. As a hundred or more of them will be needed, they make quite an item. The oval beams and struts may be bought ready shaped at a sawmill, or they may be shaved down by hand. It is safe to say, however, that a good man working two hours each evening with fair regularity can finish a machine during the winter. [Turnbuckles, guy wires and all parts may be purchased all ready for use from any of the supply houses or builders advertising in "Aeronautics," saving considerable time and labor for the man to whom expense is not such an important item.]

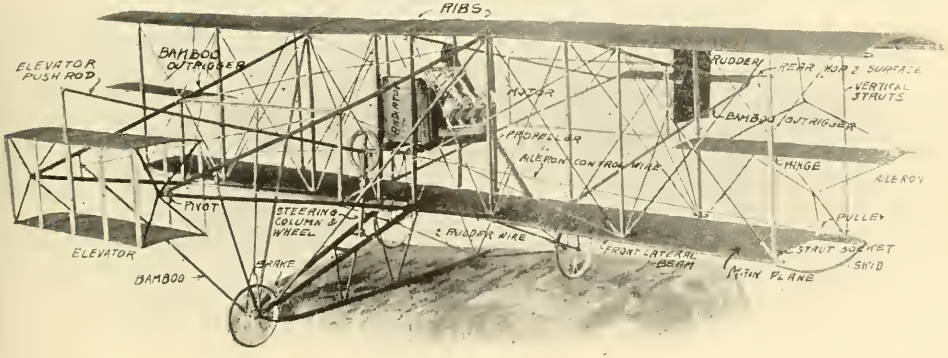
First of all the prospective builder will want to know the cost. The best answer is that the machine will cost all the builder can afford, and probably a little more. As a matter of fact, it depends, as indicated above, largely on the amount of detail work which the builder chooses to do himself, and also on the quality of material which he uses. Quality should never be skimped in such a way as to make the machine unsafe; but there are many ways in which one can save money or lavish it, according to his bank account. The surfaces may be covered with rubberized silk at a cost of $200, or with ordinary linen cloth coated with a home-made preparation at a cost of perhaps $30. The thousand feet of trussing necessary may be of piano wire at 4 feet for a cent, or steel cable at four cents a foot. The minimum figure for the complete machine, exclusive of the motive power and accessories, will be about $150; the maximum about $500.

The motor is another proposition entirely. A man who is acquainted in a number of garages and automobile repair shops may be able to pick up a second-hand motor which will do the work for a couple of hundred dollars. Any motor which will actually develop 30 h. p. at 1,000 revolutions will fly this machine. As to the weight, the lighter the better, but 400 pounds for the complete power plant is not excessive. Low power and considerable weight will naturally make a sluggish machine, but one all the better for the beginner, as he will not be tempted into rash feats.

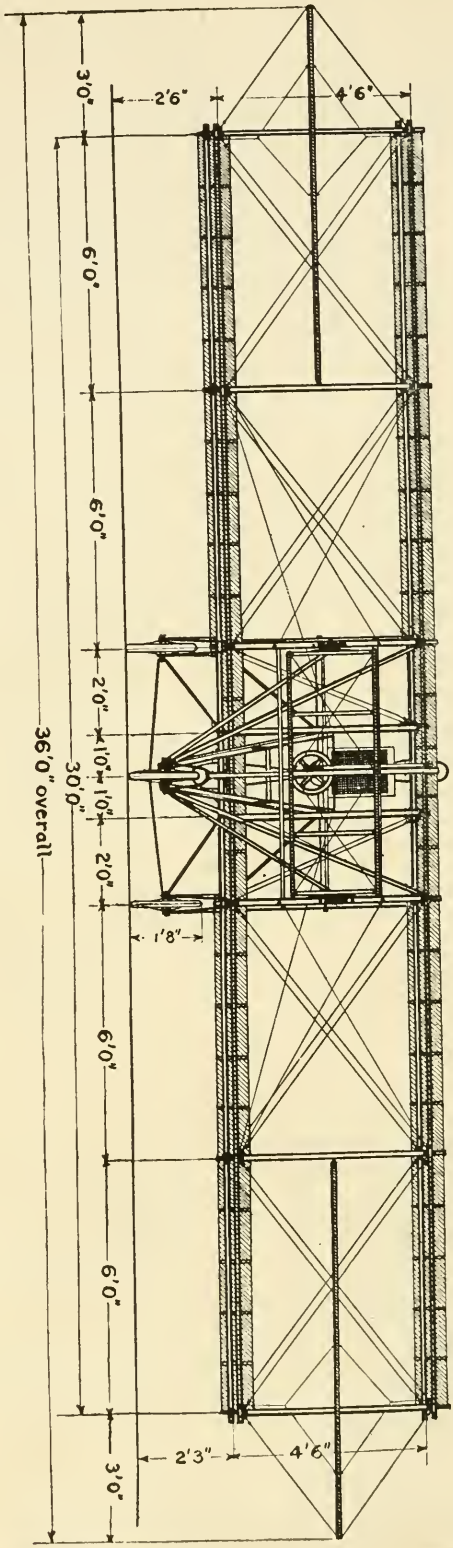
On the other hand, if one is plentifully supplied with cash there are a number of special aeronautic motors of 25 to 50 h. p. costing from $500 to $3,000.

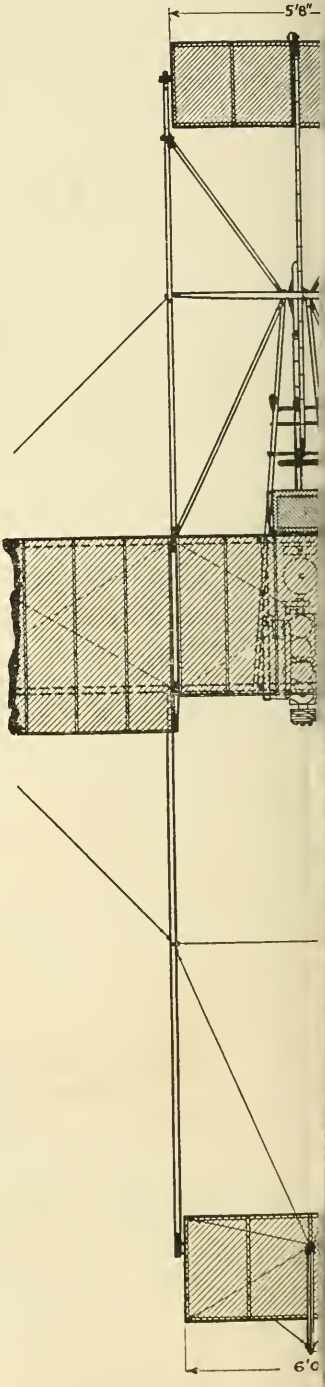
A workshop of considerable size will be necessary. To assemble the machine completely a clear space 40 feet square must be obtained. It is possible, however, to do most of the work in a smaller room, building the machine in sections, and assembling these only when all are completed. If the work is done in this way a space of 10 by 15 feet will serve. When the machine is ready to fly the budding aviator must of course find a suitable field, smooth and unobstructed and at least 10 acres in extent. If no building of sufficient size can be had at the field for the assembling of the machine, the work may be done in the open air, the machine being covered at night and in stormy weather with a tarpaulin and securely anchored to stakes.

The great advantage of the Curtiss type of construction, and the principal reason why it was chosen for this article, is the division into small sections, which allows the machine to be taken apart and assembled with the greatest ease and to be packed for shipment in a few comparatively small boxes. Glenn Curtiss' fame would be quite secure if it rested only on the invention of this construction; had he never flown a foot he would still be recognized as a designer and engineer of the first rank.

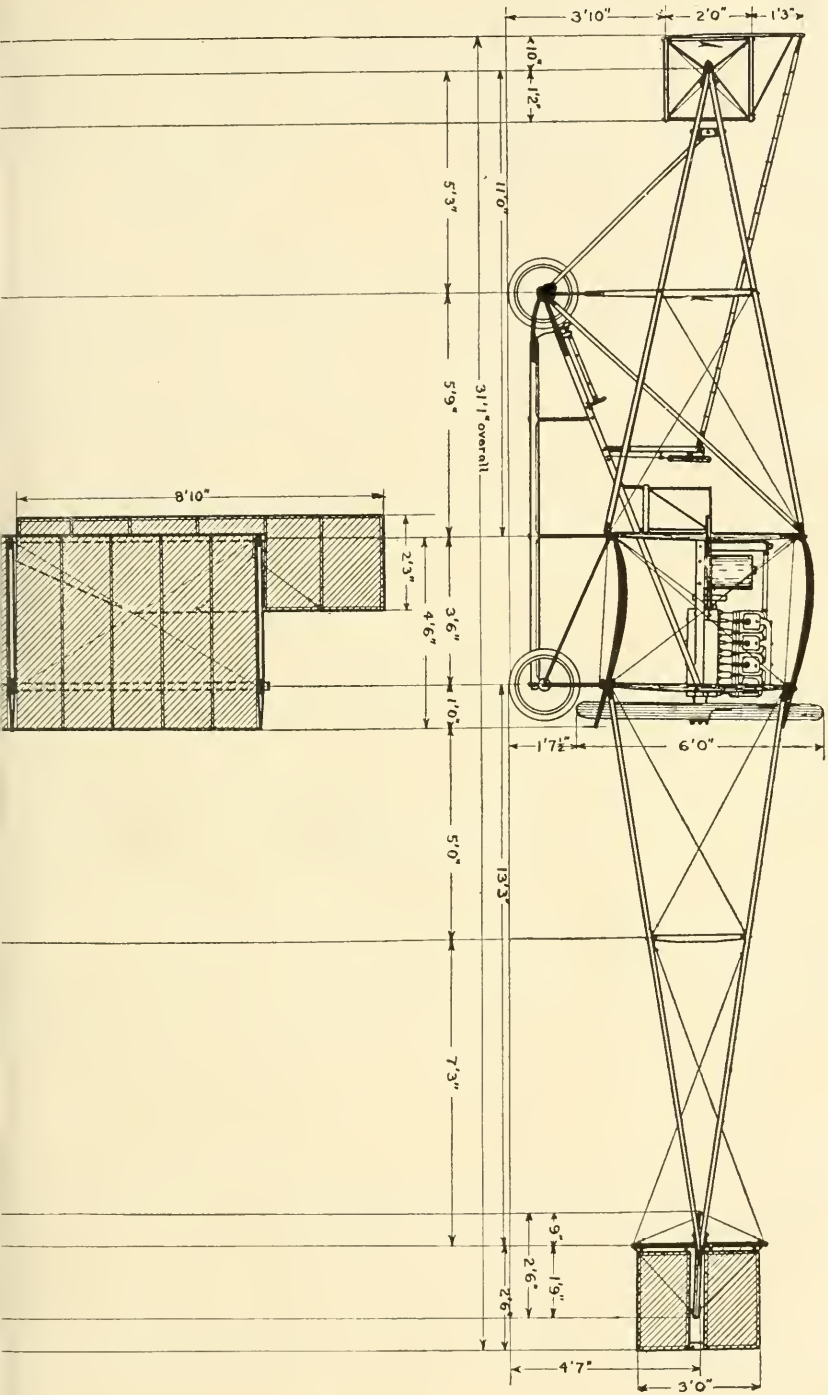


Model of a Curtiss Built by Church Aeroplane Co.





Three Views


3'10"
2'0"
1'3"
10"
1'2"
5'3"
11'0"
5'9"
31'1" overall
8'10"
2'3"
4'6"
3'6"
1'0"
1'7½"
6'0"
5'0"
13'3"
7'3"
9"
2'6"
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2'6"
4'7"
3'0"

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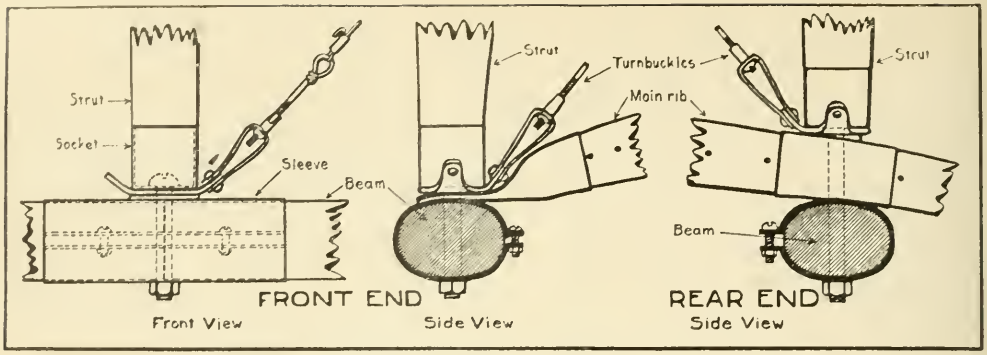


The Strut Socket Bolt Passes Through the Main Rib and the Beam.

In the Curtiss type the main planes are divided into sections of a length equal to the distance between struts; the machine illustrated here has this distance equal to 6 feet. The struts can be taken out and the sections laid flat on each other. The framework for the front and rear rudders can also be jointed if desired. The longest parts of the machine, when taken apart, are the two diagonal beams running from the front wheel back to the engine bed, and the skid. The horizontal front rudder is packed intact; the vertical rear rudder is unhung and laid flat on the tail. Two men can take the machine apart in a few hours and can put it together in a day. Mr. Curtiss has so far refused to assert what rights he may have to the exclusive use of this construction.

The planes of the Curtiss-type machine are covered with a single surface of cloth, stretched over the upper side of the ribs which give the curvature. The ribs are in turn laid on top of the beams. Both ribs and beams are completely exposed beneath the planes. Although this probably increases the wind resistance, it makes a very light and simple construction.

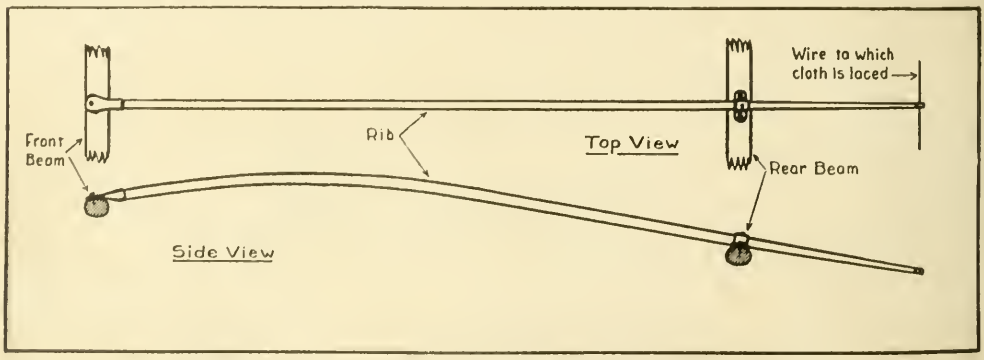
LARGER RIBS BETWEEN THE SECTIONS.

Two distinct types of ribs are used, main ribs and small ribs, both of the same curvature. The main ribs are used between pairs of struts, to hold apart the front and rear beams; they are heavy enough to be quite rigid. Three or four small ribs are laid across each section of the planes, between the pairs of main ribs, to keep the cloth surfaces in the proper shape. The main ribs are twice as thick as the small ribs, being built up of six ¼-inch layers of wood instead of three; they are ¾-inch wide and the small ribs ½ inch. The cloth surface is stretched over the tops of the small ribs and laced through a row of holes along the center lines of the main ribs. The front edge of each section of the surface is tacked to the front beam and the rear edge is laced over a wire stretched through holes in the tips of the ribs. After the cloth is stretched tight, it is tacked to the small ribs, a strip of tape being laid under the tack heads.

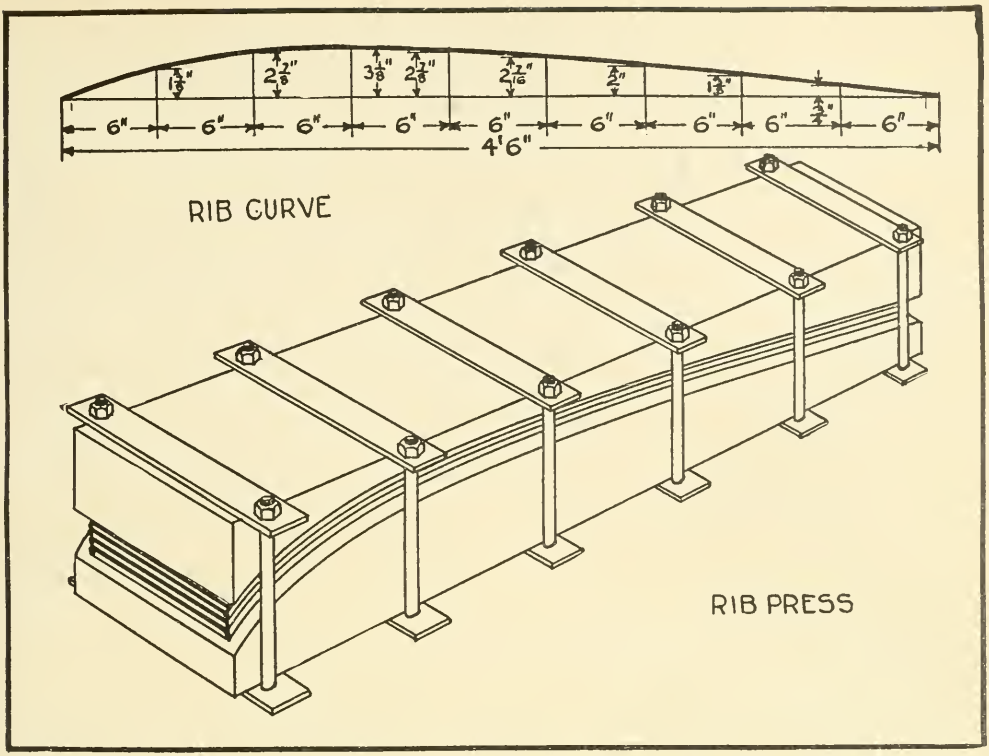
The upright struts which hold the two planes apart fit at each end into sockets, which are simply metal cups with bolts projecting through their ends. Those at the bottom of the front row of struts pass through the eyes of the turnbuckles and connections for the wire trussing, then through the flattened ferrules of the main ribs, and finally through the beam, all being clamped together with a nut; those at the top go through the turnbuckles first, then the beam, and finally the rib ferrule. The bolts at the back row of struts must go through the full thickness of the main ribs, and so must be longer. The drawings on this page show the method of attachment of both main and small ribs. It may be noted that in the drawing a neat method of attaching the turnbuckles is shown; instead of being strung on the socket bolt one after another they are riveted to the corners of a steel plate which alone is clamped under the socket.

The beams are jointed at each strut connection; the ends are cut square and united by a sheet steel sleeve, clamped on by two small bolts. The hole for the socket bolt is drilled half in each of the two abutting beams. As it is very difficult to get long pieces of wood sufficiently straight-grained and free from knots, this jointed system considerably cheapens the construction. Both beams and struts are spruce; but to give a little additional strength, the beams of the middle section may be ash.

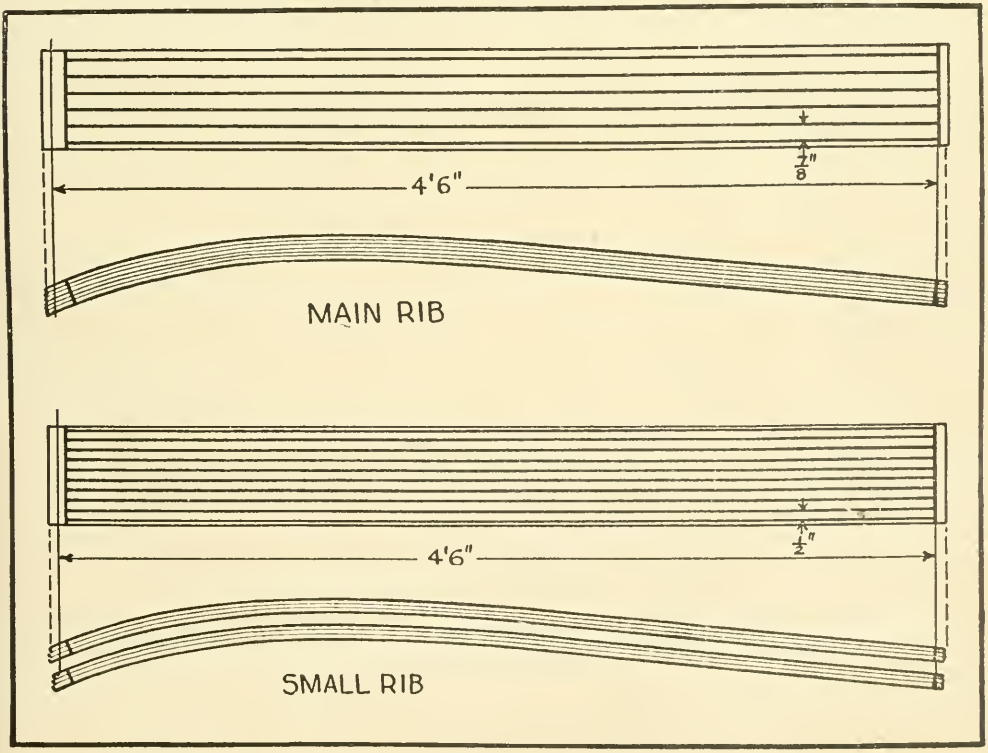
If the aeroplane is intended to be taken apart very often, the standard design, as shown in the large drawings, can be modified so as to make it unnecessary to unlace the cloth each time. This is arranged by regarding the two outer sections at each end of the plane as one, and never separating them. Additional main ribs are then provided at the



The Small Ribs are Laid Over the Beams and Fastened with Screws.



The Rib Curve and the Press in Which the Rib Boards are Glued Together.



Showing the Way of Sawing Up the Rib Boards into the Individual Ribs.

inner ends of these sections, and are attached directly to the beams, instead of being clamped under the strut sockets. In taking the machine apart, the struts are pulled from the sockets, leaving the latter in place. It will then be of advantage to shorten the planes somewhat, say 3 inches on each section, so that the outer double sections will come under, the "12-foot rule" of the express companies.

Three wheels are provided for starting and landing. These are of the bicycle type, although with heavier spokes and wider hubs than usual. They are usually 20 inches in diameter and fitted with 2-inch single-tube tires, but larger ones can be used to advantage if the builder cares to pay the difference in price.

Two beams, preferably of ash about 1¼ by 2 inches, extend from the front wheel to the engine bed, and carry in addition the driver's seat. A third beam runs back horizontally from the front wheel, and on rough ground acts as a skid. The rest of the running gear is built up of steel tubing, mostly ¾-inch diameter. The pieces are joined together simply by being flattened at the ends and bolted through; no sockets or special connections of any kind are used. If desired, the wheels can be carried in bicycle forks, but two separate tubes, one on each side, will do just as well.

MANY BUILDERS DISLIKE BAMBOO.

For the "outriggers," and the frames carrying the front horizontal rudder and the rear vertical rudder and tail, as usually called, either spruce or bamboo may be used. Bamboo will always be found on machines made in the Curtiss factory, and it is undoubtedly the lighter of the two. Spruce, however, is easier to obtain in good quality, and is by far the easier to work. At their ends the beams or bamboo are provided with ferrules of steel tubing, flattened out and drilled through.

The outriggers are attached to the main frame-work of the machine by slipping the ferrules over the socket bolts of the middle-section struts, above and below the beams. It is preferable, however, to attach at least the rear outriggers to extra bolts running through the beams (as shown in the large drawing); then, when the machine is to be housed, the tail and rudder can be unshipped and the triangular frames swung around against the main frame, considerably reducing the required space.

The tail, horizontal and vertical rudders, and the ailerons are light frame-works of wood, covered on both sides with cloth. The wood stick are put together with strips of tin folded over the joints; these are fastened with brads, the ends being clinched, and both heads and ends soldered fast to the tin. The frames are always braced with wire in such a way that no twisting strains can come on them. The front horizontal rudder, which is a biplane construction like the main planes, is built up with struts in much the same way. Instead of being fitted with sockets, however, the struts are held by long screws run through the planes and into their ends, and passing through the eyes of the turnbuckles.

Having given a general description of the aeroplane and an estimate of its cost, it is now possible to take up in detail the actual work of construction. First, however, it may be well to call attention to the photograph reproduced, which may make clear some points which did not appear in the mechanical drawings.

The builder usually begins with the main planes and their struts and truss-wires; it is desirable to get this box-like structure completed, except for the cloth covering, and in proper alignment, before leaving it for the running gear and controls.

Both large and small ribs are laminated, being built up of six or three strips, respectively, of ¼-inch spruce, or spruce and ash, glued together in a press. This lamination is the quickest and easiest way of giving the ribs the proper curve, being much superior to steaming. The laminated ribs are glued as illustrated; it is simply a log of wood about 8 inches square and 5 feet long, reasonably clear and straight-grained, which has been sawed down the center on the curve shown in the same drawing. The two halves of the log are clamped together on the strips to be glued by a dozen bolts and steel straps.

The making of this press should be the first thing to receive the builder's attention. It is a valuable asset, as it will last indefinitely and makes possible an unlimited supply of ribs of uniform curve. The curve may be drawn direct on the log with a soft pencil, the cord line being first ruled on and a length of 4 feet 6 inches marked off on it, with margins of 2 or 3 inches at each end. The cord is then divided into 6-inch sections, and perpendiculars erected, on which the distances which define the curve are marked off. Finally, draw a smooth curve through the locating points, continuing it at each end through the margin. Any saw-mill which has a band-saw will cut the log down the curve for 25 cents or so. It will pay the aeroplane builder to get acquainted with the nearest saw-mill, as its services will often be required.

The bolts should be ¾-inch in diameter and 15 inches long. Eye-bolts are convenient, as they may be tightened up with one wrench and a bar. The steel straps should be ⅜ by 1½ inches, about 10 inches long, with ¾-inch holes drilled 9 inches apart on centers, for a log 8 inches wide.

PROCEDURE IN GLUEING LAMINATED RIBS.

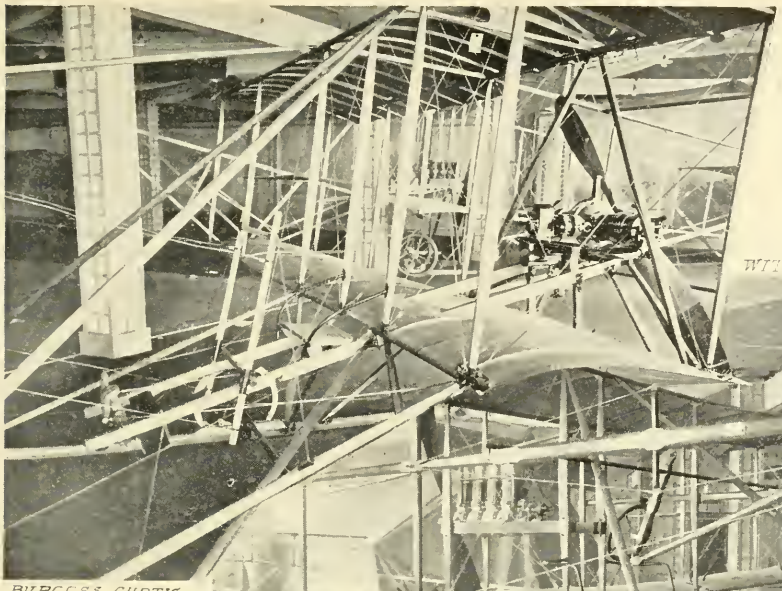
Boards of reasonably clear spruce, ¼-inch thick, 6 or 7 inches wide and about 4 feet 9 inches long, are used for rib material. These must be obtained from the saw-mill, as it is hopeless to attempt to make them by hand. Six boards are put in the press at each glueing; if the batch is intended for small ribs, the glue is omitted between the third and fourth boards. The glue used should be the kind which comes in sheets, and must be dissolved in boiling water; it may be applied quite thin with a good-sized paint brush. When the batch of six boards is put in the press, the end bolts should be tightened up first, as the upper part of the press is apt to be weak in the center if not liberally proportioned. The tightening up should be gradual, each bolt being taken up a little at a time, but should be continued until the glue oozes copiously from between the boards. Twenty-four hours should be allowed for drying. The glue-cracks in the finished ribs should be almost imperceptible.

The laminated boards taken from the press should be sawed up by a power rip-saw at the saw-mill, to the dimensions shown in the drawing. The saw usually takes a cut ⅛-inch wide, and this should be allowed for in estimating the number of ribs which can be obtained from each board. A margin should be left at each side, as it is impossible to get all the thin boards squarely in line. Twelve main ribs will be required (or sixteen if the builder uses the quick-detachable plan described heretofore), and either thirty or forty small ribs, according to whether three or four are used in each section. It is advisable to make up a number of spare ones besides.

When the rough-sawed ribs are received from the saw-mill the sharp edges should be rounded off and they should be tapered down at the ends to fit the ferrules, with a small plane or a spoke-shave. In doing this it must be remembered that the upper surface of the small ribs gives the curve to the cloth surfaces, so that any tapering should be done on the lower side. The main ribs may be tapered from both sides, as it is the center line, the crack between the third and fourth laminations, that determines the curve. Small holes should be drilled an inch apart along this line for the lacing.

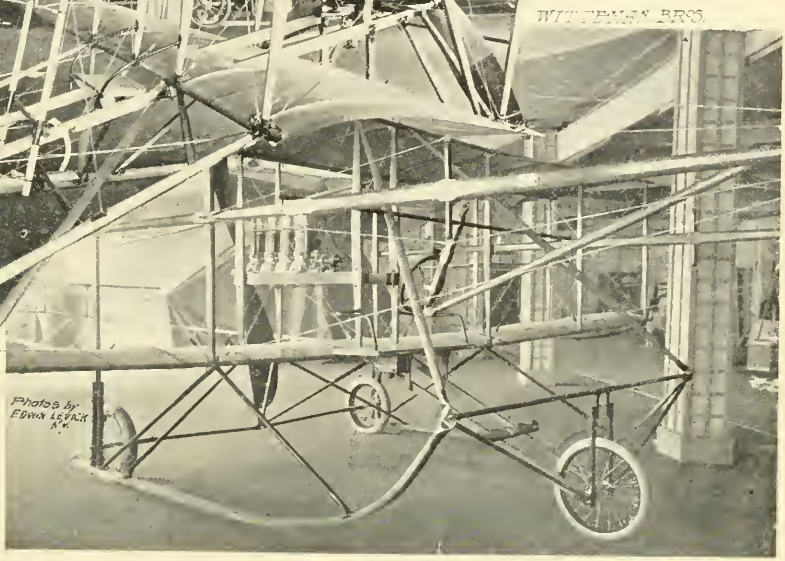
The ferrules for the front ends of the small ribs are ½-inch steel tubing, rather light;

(Continued opp. p. 78)



BURGESS-CURTIS

AERO SHOW AT NEW YORK



THE Aero Show held in conjunction with the independent Auto Show in Grand Central Palace, which closed January 7th, was a real success. Though not half the engine and other manufacturers were represented, the exhibits covered more than one entire floor and constituted the biggest indoor showing of aeronautic material yet held in this country. All exhibitors reported either actual cash business to a satisfactory amount, or plenty of good prospects.

AEROPLANES.

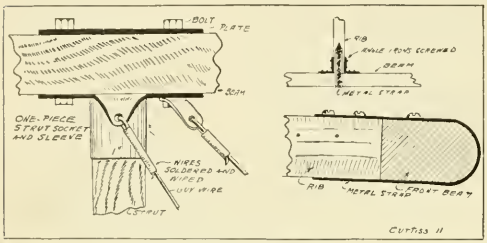
The Burgess Company & Curtis, of Marblehead, Mass., showed two of their standard biplanes, model D and model B. Model D, a two-passenger machine, is about the size of a Farman, resembling it closely, except that the front outriggers combine the oblique struts of the Wright machine. These brace the front structure and ward off many damages in landing. The planes spread 36 ft. by 6 ft. fore and aft, spaced 6 ft. apart. The total supporting surface is 536 sq. ft. The total length is 42 ft. Stability is by Farman type ailerons, with the addition of "Greely Curtis non-infringing deflectors" at the front edge, on top of the upper plane. The motor is an 8-cylinder 50 h. p. Indian driving a Burgess 8 ft. diameter 56-in. pitch propeller. The cylinders are 4x4, which figure A. L. A. M. 51 h. p. It is said to give 60 b. h. p. The standing thrust obtained is 462 lbs. at 1,240 r. p. m. The wings, front and rear surfaces and power plant are so arranged that they may be easily taken apart for shipment. The central portion then occupies a space 10 ft. by 7 ft. by 7 ft. This model is listed at $6,500.

The model B resembles the Glenn Curtiss machine, except for the controls and running gear. The planes spread 26 ft. by 4½ ft. fore and aft, separated by 4½ ft. Total area 286 sq. ft. The elevator is a double-plane box type; the rear single plane is fixed. The vertical rudder is operated by the foot. Curtiss 4 cylinder 25 h. p. engines are supplied with this model, and El Arco radiator Bosch magneto, and Goodyear tires complete the equipment. This lists at $4,500. The plane shown had a Clement Bayard engine fitted. A full description with scale drawings of the model D machine will appear in the next issue.

The Wright Company, Dayton, Ohio, showed the "baby" 30 h. p. used by Johnstone in making the world height record at Belmont and a "bran" new one, finished in natural wood, of the two-man size. This was the one later delivered to Robert J. Collier. It was beautifully finished throughout and is the first one put out by the Wright Company thus far to the general public of this country. The Wright exhibit, in charge of aviator J. C. Turpin, attracted great attention—everyone wanted to see the "baby." Some good prospects appeared as a result of the exhibition.

Glenn H. Curtiss, 1737 Broadway, New York, showed a one-man machine of his standard construction and a Curtiss 8-cylinder engine with propeller mounted. A section of the main planes was shown separately. In this, the construction was a still further refinement of that heretofore employed. The ribs ended flush with the lateral beams in front and were flush with the top of the rear beams, making a smooth outline. A strip of wood ran along the rear ends of the ribs. Each plane was covered top and bottom with Naiad No. 6 cloth. A piece of tin is used between the cloth and any metal plate or sleeve to prevent the cloth's tearing. Where strut sockets come at joints of lateral beams, the socket and sleeve for joint are one piece.

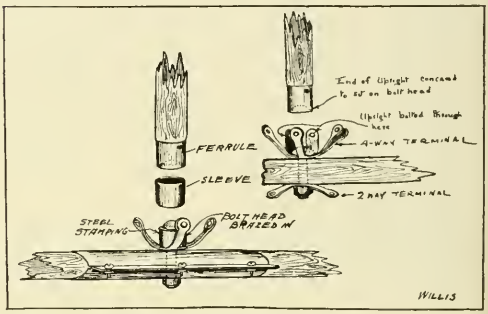
The Walden-Dyott Company, 50 Church street, New York, showed their monoplane with which both members of the firm have been making flights at Mineola. A description of this machine appeared in a recent issue. An instrument, about the size of a big watch, has been designed by this company, which they call a "levelometer." It is fastened to outrigger in sight of the driver. A swinging hand denotes at once whether the machine is flying up or down hill and at what degree. This will be put on the market. The entire control of this machine is in the steering wheel and column, which latter is mounted on a universal joint. The wings can be quickly taken off, leaving the bare chassis for transportation. A school will be started at Mineola where men can learn to fly at an expense of but $150 for the course, including actual shop work in making own repairs. Gibson propellers, Anzani engines and Pennsylvania tires are standard equipment on the W-D machines.



New Curtiss Features.

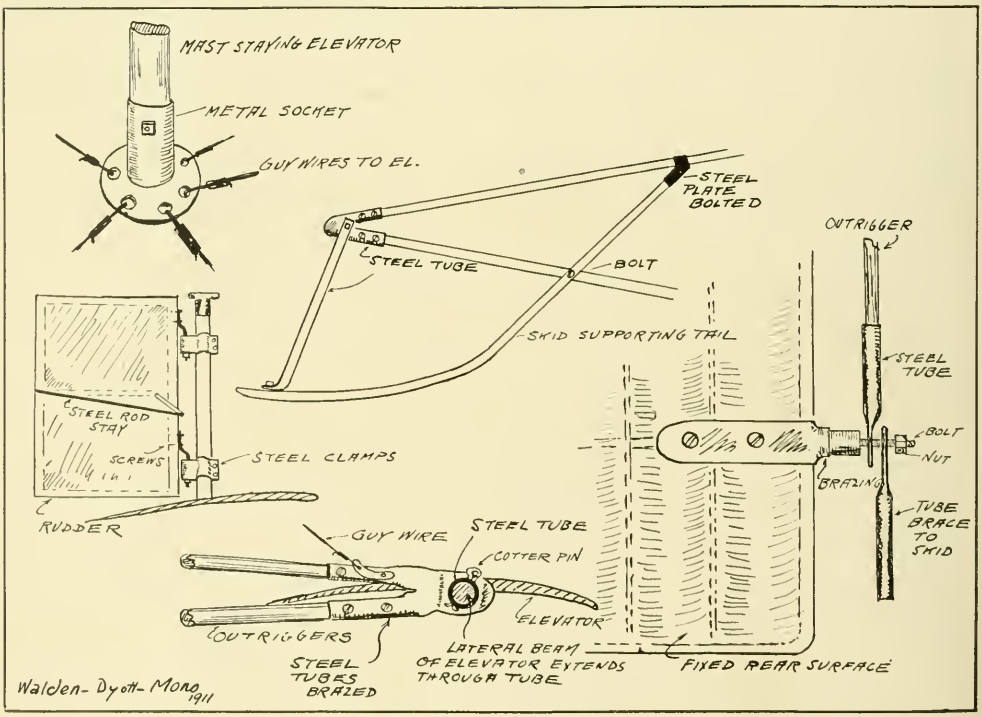
C. & A. Wittemann, 17 Ocean Terrace, Staten Island, N. Y., exhibited one of their finely finished gliders and a power machine. In the glider the planes are now set at a slight dihedral angle. One of these was sold at the show. The power machine, for two people, had many novel features. The running gear is wholly new, each of the three wheels being equipped with spring shock absorbers and the two rear wheels have springs to take up side thrusts.

The steering arrangement is novel. The front outriggers consist of but a single spruce spar on each side, which is stayed with cables to top of lower planes with bridge trussing to maintain rigidity. The planes are in three sections, the outer ones set at a dihedral angle of 3 degrees.



Two Willis Strut Sockets.

The power plant is an Elbridge 4-40 "Special" driving a Gibson propeller 7 by 6 ft. pitch. The standard equipment includes El Arco radiator, Bosch magneto, G. & A. carburetor, Naiad cloth, Roebling cable, and Hartford tires. A scale drawing, with all de-



Walden-Dyott Parts.

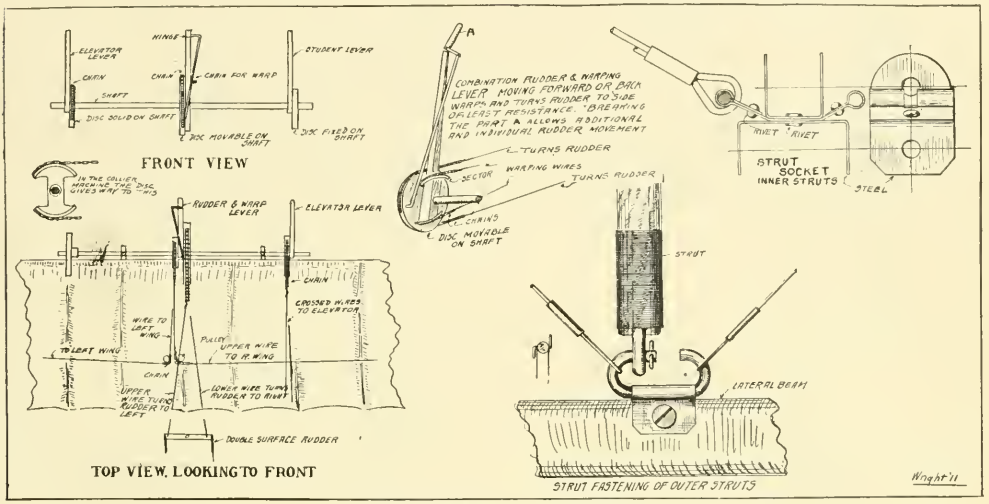
tails will appear in an early issue. Four of these machines were sold at the show.

The Volanaut Construction Company, Flushing, L. I., showed the skeleton frame of a Curtiss type, with all metal parts nickeled. This exhibited fine workmanship and care throughout, though for that matter, so did all the machines. In this machine the ailerons are hinged on the rear beam and move both up and down. All nipples were full threaded, of the special cable used in guying; the 3/32 in. stands a strain of 1,132 lbs., and the 1/16 in. 750 lbs. A feature of this machine is the hollow woodwork throughout except struts.

The standard equipment consists of an "Aeromotor" power plant, Mea magneto, Hartford tires.

Frank Van Anden showed his Baldwin style machine with a wooden engine, in the inside and propeller, with which a speed of 40 m. p. h. on the ice is claimed.

John H. Davis, 25 Broad street, New York, agent for the Hall-Scott engines, showed their 8-cylinder 4 in. by 4 in. A-2, with the H-S propeller. This is intended to give 60 b. h. p. at 1,200 r. p. m. and 70 b. h. p. at 1,500 r. p. m. Purchasers have the privilege of seeing the 9½-hour test run which each engine gets before leaving the factory. This engine is used among others by Hamilton, Masson, and Captain Baldwin has placed his order for two. It is said that the 60 h. p. motor has even developed 80 h. p. on spurts up to 1,900 r. p. m. Mea magneto and Schebler carburetors are standard equipment. The 1911 motor has some slight refinements over the 1910 model and a full description will be given in a subsequent issue.



Control System of the Wright.

of which was an electric motor which turned the propeller. This had an El Arco radiator and both Pennsylvania 4-in., and Hartford tires.

Through Captain Lovelace, the director of the aero show, were shown Moisant's Paris-London Bleriot and Garros' Demoiselle. The Lovelace-Thompson Company exhibited a Bleriot type framework sold to the Aeroplane Sales Company, 1777 Broadway, New York.

MOTORS AND ACCESSORIES.

Ten motors were shown: the Fox "De Luxe," Hall-Scott, Indian, Curtiss, Anzani, Aeromotor, Elbridge, Clement-Bayard, Metz, and Kirkham.

The Aerial Equipment Company, 735 Seventh avenue, New York, showed a 3-cylinder and a 5-cylinder Anzani; also "Normale" propellers, such as used by Latham and Leblanc at Belmont, for which this company is agent. One of the 5-cylinder motors was sold to B. T. Babbitt Hyde. The new Anzani motors are being equipped with magneto ignition, instead of battery as heretofore.

The 1911 Elbridge "Special" is fully described elsewhere in this issue.

The American Safety Aerocar Corporation, of Richmond Hill, L. I., agents for the Fox motors showed the 36 h. p. Fox "De Luxe" 4-cylinder 2-cycle 3½ in. by 3½ in. This was the identical engine flown with by Mrs. Raiche at Mineola. The weight of 150 lbs. includes two Schebler carburetors, Bosch H. T. magneto. A full description of the Fox motor was given in the January issue.

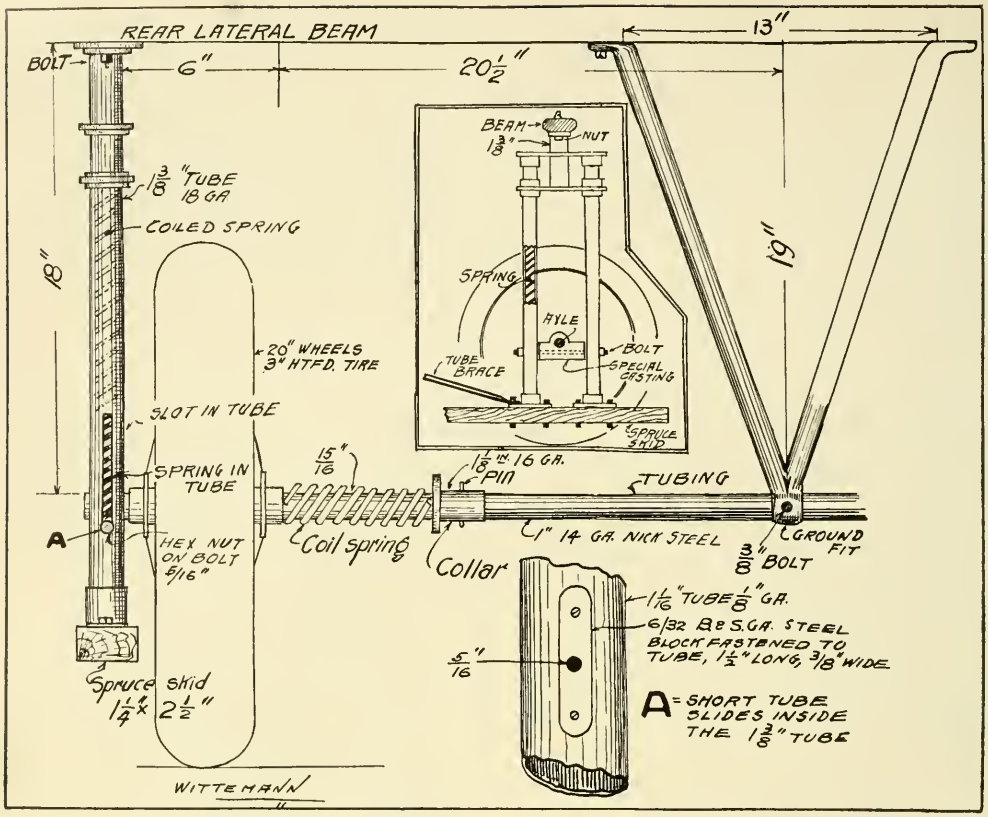
The Metz Company, Waltham, Mass., showed their 5-cylinder 100-125 h. p. The cylinders are 6¾ in. by 6¾ in. A small sleigh was shown driven by the 2-cylinder Metz engine

Two "Aeromotors" of the Detroit Aeronautic Construction Company, Detroit, Mich., were shown by the E. T. Willis Company, 85 Reade street, New York. Three sizes of these: 30-40 h. p. 4-cylinder 4½ in. by 4½ in.; the 40-50, 4-cylinder 5 in. by 5 in., and a 6-cylinder 5 in. by 5 in. Five of these motors were sold during the show. A detailed description was printed in a previous issue.

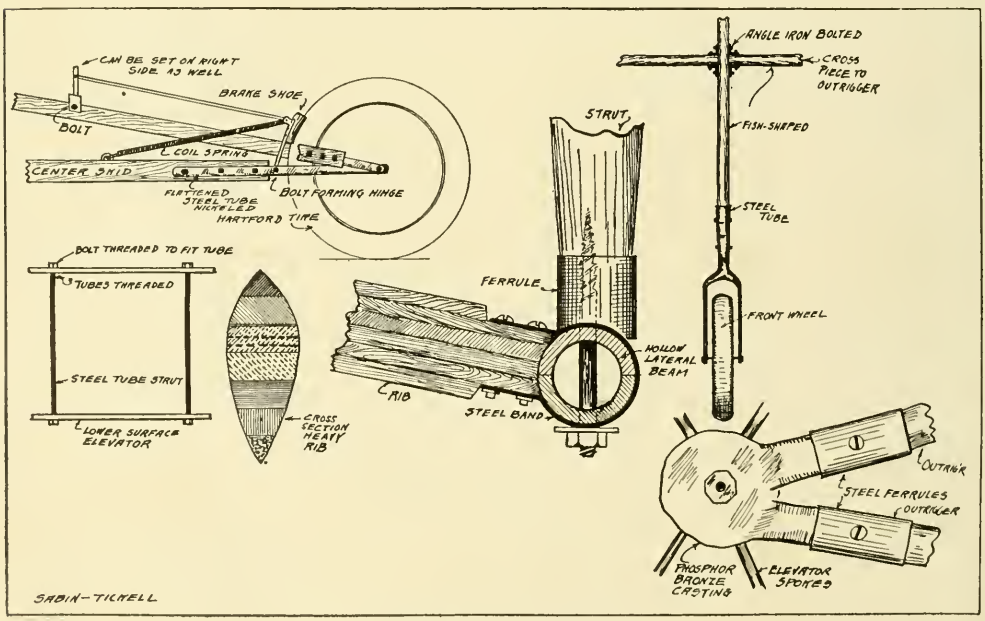
The exhibit of the Willis Company was a whole show in itself. The concern showed a full line of wheels, ribs and struts, turnbuckles, sockets; Gibson, Harris-Gassner and Brauner propellers; oil and gas tanks, El Arco radiators, Curtiss-type ailerons, and even non-skid chains for starting on the ice. The Harris-Gassner propellers are stocked by both Willis and the Mineola Specialty Company.

The new Willis strut fastening allows for quick take down. To take machine apart, loosen only the turnbuckle, lift bottom of ferrule up flush with bottom of the fitting on the strut and slide the strut off. Note the socket on the strut is concave and fitting on cluster is convex, and furnished with 2, 3, or 4-way terminals brazed on. The 2, 3 or 4-way terminals at bottom are loose. Bolts used are 5/16 in. diameter, 2 in, 2½ in., or 3 in. long.

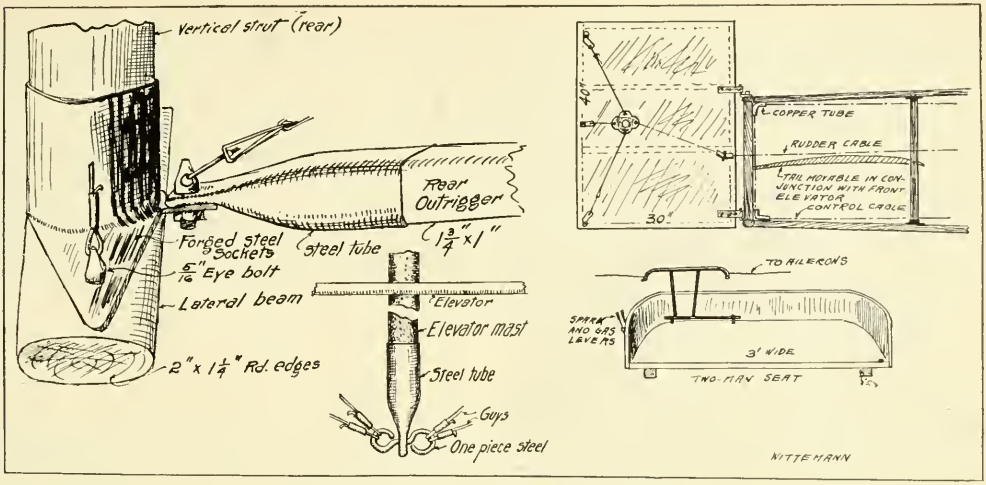
The Kirkham-Eells Company, of Bath, N. Y., showed their 4-cylinder motor, which has been flying their aeroplane for the past six months, and parts of a new 6-cylinder 50 h. p., with which they will guarantee 50 h. p. for 5 hours at 1,300 r. p. m. The cylinders will be 4¼ in. by 1¾ in. The weight will be 235 lbs. complete with magneto, water and oil pumps. This will sell around $1,280. One of the new concentric valves was shown.



Wittemann Rear Axle and Spring Wheel.



Some Parts by Volanaut Co.



Some Features of Wittemann Biplane.

The D. & F. Radiator Company, 506 West Fifty-third street, New York, is a new concern to enter aeroplane radiator field. This concern makes, also, combination copper gas and oil tanks in torpedo, round and flat heads at prices from $3.65 to $14.70. Two brands of radiators were shown: "Light Weight," and "Feather Weight;" the 35 h. p. sizes in each weighing respectively, 32 and 24 lbs. Prices range: $45, $55, $70, and $80, less 40 per cent on the "Light Weight," and 20 per cent on the "Feather Weight."

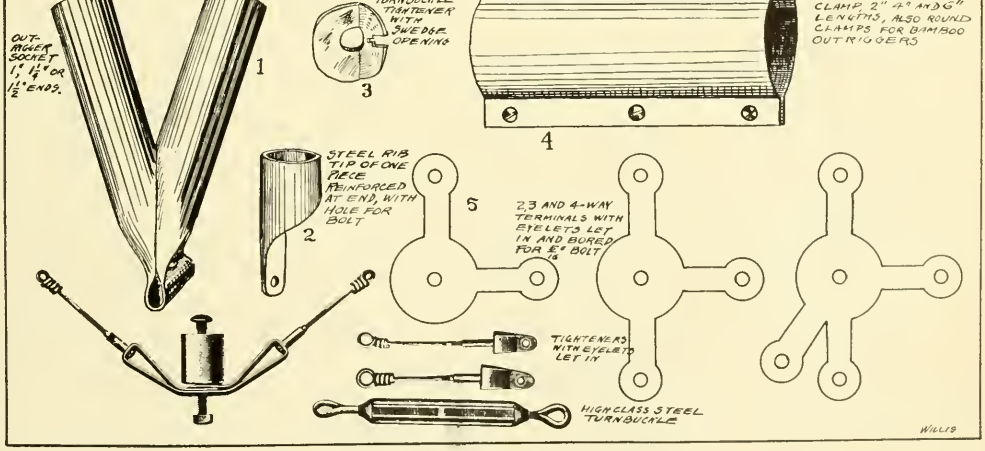
The American Metal Fusing & Cutting Company, 407 East Thirty-first street, New York, was an exhibitor of their process of autogenous welding, and cutting. A liberal offer is made of rental of machines at $50 for six months. By use of an oxy-acetylene flame, broken crank-cases, cracked cylinders, welding water jackets, cutting plates and holes, making intake and exhaust manifolds, are easily handled. A sight of this apparatus at work ought to make any aero motor builder dig in his jeans at once.

The Scientific Aeroplane Company, Room 51, Beach Building, 125 East Twenty-third street, New York, showed a Sperry gyroscope in action, taken from one of this concern's aeroplanes. The weight complete is 30 lbs.; resisting force nearly 1,000 lbs.; the wheel makes 10,000 r. p. m. in a vacuum with 1/5 h. p. and will run for 1¾ hours after engine stops. It is run by a belt from the engine. This is the sole case known where a gyroscope has been applied to an aeroplane for transverse stability.

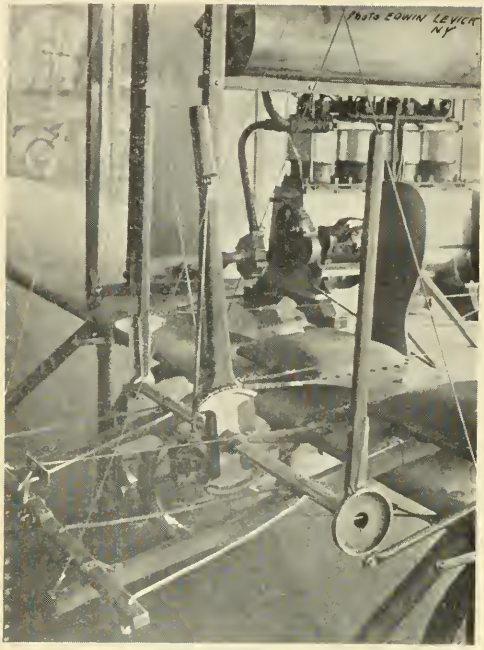
The U. S. McAdamite Metal Company, 18-28 Rapelye street, Brooklyn, New York., had a most comprehensive exhibit of "strong as bronze and one-third the weight," McAdamite pistons, gears, Curtiss and Kirkham crank-cases. Hundreds of castings showed the diversity of application.

The Acme Oil Engine Company, Bridgeport, Conn., showed a line of laminated stained ash propellers. The maker of these made all the propellers for the Kimball helicopter and biplane, and for A. M. Herring for several years past. These Acme propellers were of good workmanship, of both uniform and variable pitch. A specialty will be made of stocked monoplane parts.

The Gibson propeller exhibit was very complete, the biggest at the show. All sizes were shown and those designed for particular makes of machines were plainly labeled for the benefit of visitors. These propellers, in a less highly finished state, are being offered at lower prices as "practice propellers."



Some Parts Shown by E. J. Willis Co.



Collier's Wright.

The Paragon propellers made a handsome showing and good business was reported. These attracted attention because of the beauty and manner of employment of the woods used in their construction.

Both the Gibson and the Paragon propellers are shown at the permanent exhibition room of "Aeronautics."

The Aeronautical Society, Aeronautical Reserve and Flyers Club had spaces. The New York "World" had a big exhibit of models in charge of Edward Durant. W. H. Aitken did a big business in selling flying toys. A beautiful model of the Pfitzner monoplane was shown by C. G. Halpine, of 2268 Aqueduct avenue, Bronx, New York, and the Church Aeroplane Company, had a 5-ft. model of a Curtiss. The Louis L. Crane Manufacturing Company, 259 Ninth street, Brooklyn, N. Y., sold their "Yankee Flyer," a flying model monoplane.

The American Aeroplane Supply House, Garden City, L. I., had for sale complete scale, and full size drawings of parts, of the Bleriot XI monoplane, together with a collection of well made Bleriot ribs and parts. This concern is to keep in stock a complete set of all parts for Bleriot type machines.

A new aero school had space, the Aeronautic School of Engineers, West Fifty-second street, New York. Cole & Company, of Asbury Park, N. J., had a big line of photographs taken at various meets.

A. J. Myers had a big display of G. & A. carburetors, which are standard equipment with Anzani and Elbridge engines.

George Bold had at the Aeronautical Society's spaces, a device for automatic stability, which could be manually operated as well. Front and rear controls were mounted on the same shaft, in the center of which was a universal joint from which a pendulum hung. A weight was employed on this pendulum, which could be moved up or down to secure more or less movement of the pendulum. The pendulum could be moved by hand, as well as by gravity.

The J. S. Bretz Company exhibited at the Garden Show F. & S. imported ball bearings, made by Fichtel & Sachs, Schweinfurt, Germany. U. & H. master magnetos, the English Bowden wire mechanism, of which they are the sole importers, and German steel balls.

The feature of the display was a Gnome motor, which was used to display the application of twenty-eight F. & S. annular ball bearings in its construction. Among the ball bearing parts shown, is the ball bearing crankshaft of the Gnome motor, and the ball bearing connecting rods of the motor.

All the different models of the well-known U. & H. "Master" magnetos, made by Messrs. Unterberg & Helmle, Durlach, Germany, are shown. They are all of the true high tension type, equipped with ball bearings, and the U. & H. interrupter; the interrupter itself being a one-piece construction, and one of the most simple ever made.

The feature of the magneto display was the new low priced self-starting magneto, enabling any one to start even the largest motor, without the use of batteries, and the duplex racing magneto, in which two armatures are employed, mounted tandem, and running in the same armature tunnels on one shaft.

The operation of the Bowden Wire Mechanism is clearly shown by being fitted to a handle bar of a motor-cycle, and to the steering wheel and pillar of an automobile; the wire, in both cases, operating an auxiliary air shutter on a carburetor.

A. A. Ryan, president of the Aero Club of America, and Robert J. Collier, head of the National Council, have resigned as directors in the Wright company.

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Waterproof, Flexible, Acid Proof. No heating. Just apply from can. ***Ambroid*** is the ***toughest glue*** known. Marvelously strong for frames or fabrics. Repairs gasoline or oil leaks.

Sample and Description 10c.

REGISTERED AMBROID U.S. PATENT OFFICE

These two wonderful products are absolutely indispensable for making or repairing a first-class Aeroplane. Weather and rough handling do not affect them.

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VARNISH

Most wonderful varnish ever heard of! ***Absolutely weather proof,*** oil or gasoline proof. Will never dry out or crystalize. You can not scratch it. Makes the ideal smooth surface. Flexible.

Write Dept. F.

THE LOS ANGELES MEET

By Prof. H. La V. Twining

Ely Flying the New Curtiss.

PROGRESS OF AVIATION AS SHOWN BY THE SECOND MEET IN LOS ANGELES.

ONE year has passed since the first aviation meet ever held on the American continent took place in Los Angeles, and it is over a year since the first international meet at Rheims. The second meet held in Los Angeles, December 24 to January 2, which has just passed into history, might be expected to show what progress had been made in one year in the science and art of flying.

LITTLE PROGRESS IN SCIENCE.

So far as the science is concerned, very little progress has been made. In principle, the machines that flew this year are the same as those that flew last year. The only marked change is found in the removal of the front horizontal rudders in the Wright machines. Curtiss also removed his front horizontal rudders on one of his machines, and, so far as the onlookers were concerned, he seemed to fly just as well without them as with them.

The principles of flight as embodied in the biplane and the monoplane are well understood today, and any advance in principle must come from a study of the bird.

The art, however, has made wonderful strides. The careful flying in still air of a year ago has given place to safe flying in comparatively strong winds. The cross-country flights in Europe, the flight of Hoxsey above Mt. Wilson, the flight of Willard over the cities of Los Angeles and Pasadena, and the flight of Masson in a mail carrying attempt between Los Angeles and San Bernardino, all mark a long step forward in the art of aviation. The flight of Hoxsey, when he encircled Mt. Wilson at an altitude of 10,005 ft. (official), it seems to me, is more remarkable than the flight of Chavez over the Simplon pass.

HOXSEY'S FLIGHT GREATER THAN CHAVEZ'S.

The Simplon pass has an altitude of 4,470 ft., while the peaks of the San Gabriel Mountains rise to an altitude of from 6,000 in Mt. Wilson to 10,000 in Old Baldy. With the exception of Baldy, Hoxsey was high enough to clear the whole range by 1,000 ft. It took him 2 hours and 7 minutes to climb from the Dominguez field, a distance of 27 miles, to about 4,000 ft. above Mt. Wilson. From this point he could have crossed the San Gabriel range into the desert 20 miles away with perfect ease. He had gasoline enough to last him 5 hours. This demonstrated clearly the possibility of a flight by aeroplane across the mountain ranges, across the desert, and across the western plains to the Atlantic seaboard. From the top of the mountain he returned to the Dominguez field in 19 minutes, which would give him a speed of 85 miles per hour on his return.

The flying of the Wright machines brought out the wonderful skill which had been developed by the aviators, demonstrating the fine point to which the art of balancing had been carried. The spiral dips, the ocean wave, and the steep glide, made by Hoxsey as he dropped out of the sky, showed the almost perfect control that the aviators had over their machines.

In these exhibitions Walter Brookins is a past master, and while Hoxsey was away on altitude flights Brookins demonstrated his wonderful control of the biplane.

But the flying machine is not perfect any more than are other machines made by human hands. They break at times, with disastrous results to the aviator.

ARCH HOXSEY'S LAST FLIGHT.

On the 31st of December, Hoxsey left Dominguez field at one o'clock for an altitude flight. The barograph shows that he ascended about 7,200 ft. in 50 minutes. Not a breath of air had been stirring up to this time. The

THE LOS ANGELES MEET. RESULTS OF MEET.

Records for Meet.

Altitude—Arch Hoxsey, 10,575 fet. **New American record).**

Speed—James Radley, 1 minute and 50 seconds (1¾ miles).

Speed, five laps (8.75 miles)—James Radley, 9:13 1-5.

Total duration for the meet—Arch Hoxsey, 17:17:27 4-5 **(New American record).**

Endurance—Arch Hoxsey, 3:16:50 **(New American record).**

Bomb-throwing—Willard, 12 points out of possible 25.

Quick start—Parmalee, 55 ft.

Accurate landing—Brookins, 9 ft. from center of square.

Local amateur record—Glenn Martin, three laps, 12:36; one lap, 3:58 3-5.

Carrying passenger—Parmalee and Knabenshue, in the air 30:30; altitude, 1,500, Brookins and Knabenshue.

Total Endurance.

Hoxsey (Wright)	17:17:27 4-5
Latham (Antoinette)	11:16:33 4-5
Parmalee (Wright)	10:50:25
Willard (Curtiss)	7:10:09
Ely (Curtiss)	6:20:25 1-5
Brookins (Wright)	5:06:25
Radley (Bleriot)	3:33:27 3-5
Curtiss (Curtiss)	1:05:50
Beachey (Curtiss)	54:45
Martin (Martin)	24:25
Robinson (Robinson)	18:25

Prize Winnings.

Hoxsey (Wright)	$3,200
Parmalee (Wright)	1,925
Latham (Antoinette)	1,450
Willard (Curtiss)	1,100
Radley (Bleriot)	925
Ely (Curtiss)	800
Martin (Martin)	450
Brookins (Wright)	425
Curtiss (Curtiss)	250
Total	$10,525

These prizes are in addition to heavy guarantees paid aviators.

H. LA V. TWINING,
Chairman of Judges.

CHAS. E. RILLIET,
Chairman Contest Com.

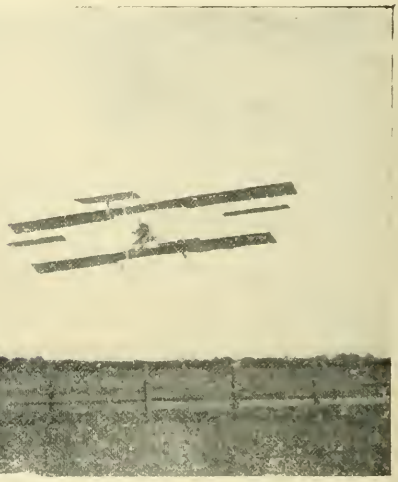
W. H. LEONARD,
Clerk of Course.

thermometer stood at 66 degrees and the barometer at 29.85 in. The air was dry and electric. Suddenly a puff of wind came from the north. The aviators had been complaining all the morning of pockets in the air, of eddies, of downward currents and of upward currents. The flying was dangerous and difficult. The barograph record shows that Hoxsey was undecided as to whether to come down or not. From the 7,200 ft. level he descended to 6,300 ft. and then ascended again to 6,700, consuming about 20 minutes in this part of the flight. At this point he made up his mind to come down. Hoxsey had felt the breath of the north wind, and knowing its import, he was hurrying to the ground. He made two wide circles as he descended. As he made his last circle, finishing at about 550 ft. from the ground, he turned toward the grandstand, banking his planes steeply against the north wind. This seemed to check his speed, and he consequently lost all pressure under his planes, thus rendering his controls useless.

The testimony is conflicting, but the concensus of opinion seems to indicate clearly that he tried to start his motor. The propellers revolved swiftly a few times, then the engine stopped. A puff of the north wind caught him and turned him over laterally twice. He was headed steeply for the ground and after turning over, the machine plunged head on at a very steep angle for the ground. This plunge was made from a height of some 120 ft., as near as different observers could estimate.

The impact with the ground smashed the central part of the machine completely, throwing Hoxsey violently to the ground, killing him instantly, the planes settling down over him. As near as can be ascertained from witnesses, the engine did not fall on him. The propellers were not broken but stuck up in the air over the machine. Just as Hoxsey was coming down, Latham brought out his Antoinette to make a flight in the wind which was blowing at least 20 miles per hour. The wind was puffy, varying from 10 miles per hour to 20, 25, and more per hour. Latham arose, flew out over the field, and, just as Hoxsey was making his fatal plunge, he was heading toward him. He crossed in front of the hangars and alighted in the field some distance from where Hoxsey fell. This ended all flying for the day. The death of Hoxsey cast a gloom over the following days of the meet. The flying lacked the enthusiasm of the first days, but it was excellent in character. It was made dangerous by the condition of the atmosphere. Not because any heavy wind was blowing, but because the atmosphere seemed to be full of holes. Upward currents and downward currents in different parts of the field, eddies and whirlwinds made it difficult to keep one's balance.

Radley in his Bleriot was a synonym for speed. Curtiss with his speedy biplane came next. Latham with his big Antoinette stood for grace and stability, while the Wright machine came the nearest to real flying of any of them. The Wright and the Antoinette fought for endurance, the Wright machine finally winning.



G. L. Martin at Los Angeles.

LOCAL AVIATORS.

The local machines were a disappointment. C. F. Walsh swapped his engine for a Macomber, and while he could stay in the air half an hour with the Elbridge, he could make but a small flight with the Macomber. The Cannon boys flew considerable distances in a straight line with their biplane equipped with a Ford automobile engine. Edgar Smith with his little Demoiselle succeeded in flying some 250 ft., a short distance above the ground. This was accomplished in the face of a pretty stiff breeze, and it was a remarkable performance considering the fact that he could pick his machine up, engine and all and run around with it.

Upper Left: Parmalee in "Baby Wright."—Upper Right: Latham's Antoinette.—Lower Left: New Curtiss—Note Shortened Front Outriggers, Single Plane Elevator and Fan Tail.—Lower Right: Willard's Gnome-Engined Curtiss.

G. L. Martin, his old 3-cylinder Elbridge having been changed for a 4-cylinder, was the only one to qualify. He flew around the course on three different days, qualifying each day. On one occasion he was carried behind the grandstand and he made a cross-country flight of considerable duration, finally returning to the course, alighting before the grandstand. In doing so, however, he swung around into the fence and damaged his machine.

MEET FINANCIAL LOSS.

The meet was a grand success from the standpoint of flying, but it was marred by the accident to Hoxsey. The attendance was not more than half of what it was last year. The people of Los Angeles did not seem to appreciate the magnificent spectacle which the committee, headed by W. M. Garland had prepared for them at great expense and risk to themselves. They gave their time and money and the result was a magnificent display, the like of which Los Angeles will probably never again see. The public spirit displayed by these gentlemen is deserving of great commendation. At a large financial loss to themselves, they conducted a meet that advertised Los Angeles to the ends of the earth. The affair was arranged in the interests of charity, but the people of Los Angeles did not rise to the occasion. If the meet was a failure in any respect that failure is to be laid at the door of the mass of the people of this city, who by their failure to see the treat prepared for them, rendered a Christmas contribution to charity impossible, and made it necessary for the few who furnished the required guarantees to dig down in their pockets to make them good. Never again will a guaranteed meet be held in Los Angeles. Aviators will have to fly at their own risk for prizes that will be small or for a percentage of gate receipts.

11,474 HEIGHT RECORD UNOFFICIAL.

A local instrument maker failed to calibrate the barograph so the chairman of the contest committee calibrated it under the air pump to a standard aneroid. The 11,474 ft. record on December 26 was estimated from the uncalibrated charts, as cross section paper was used in the barograph the first three days instead of the regulation charts which were mislaid. After calibrating the instrument the regular charts were found and put on. Under these conditions on December 30 Hoxsey climbed 10,575 ft. above the field, all corrections having been applied. He also circled Mt. Wilson at an altitude of 10,005 ft. as shown by the calibrated barograph.

Before we could calibrate the chart making 11,474 ft. Hoxsey met with his fatal accident, and the barograph was taken out of the wreck somewhat damaged. We found that the case only was smashed and the brass post carrying the clock work was bent. After straightening that, the instrument was practically uninjured. Upon testing its calibration, however, we found it to be radically changed. This renders it impossible for us to calibrate the altitude curve of 11,474 ft. and this number must remain unofficial. Any attempt to read it or to calibrate it on another barograph would amount to guess work. So this record will have to stand as unofficial. However, the record of 10,575 ft. is official and was made on the calibrated chart. This height is not enough higher than the 10,499 ft. of Legagneux to constitute an official world record.

KITES AS WIRELESS STATIONS.

In future wars, or war manœuvres in times of peace, the man-carrying kite is likely to play an important part, owing to its serviceability as a wireless telegraphy station. The experiment arranged by S. F. Perkins of Boston, inventor of the man-carrying kite, whereby a one-wire aerial was carried aloft and proved a most successful medium for the receiving and sending messages, has proved successful at the Los Angeles meet. In the wireless experiment the aerial was carried aloft several hundred feet, and it was a revelation to know how easily and quickly an emergency wireless station could be established in time of war. Messages were sent to the office of the Los Angeles Examiner and stations such as those at San Diego, Catalina and San Pedro wondered what station was interfering with their calls.

LONG MODEL FLIGHT WINS STEVENS' CUP

If you perceive endeavoring to navigate Broadway, a huge paper package of indescribable shape, nondescript color, sex, age and previous condition of servitude unknown, mounted upon a pair of legs which seem to be afflicted with sudden darts, side jumps and shrinkings, as though a host of ants were laying out bunkers for a golf course thereon, do not be alarmed—it is "only a bug" going to a West Side Y. M. C. A. model contest.

Staid business men, physicians said to be otherwise sane, typewriter manufacturers, electrical engineers, candy magnates, some cranks and a few women attend these orgies of flying and often put into the arena as many as twenty-five gladiatorial representatives, there to perhaps dash out upon the barren soil of an army drill hall their last drop of rubber blood.

For the "Stevens' Cup" have been fought the greatest battles of all. This was offered by Aeronaut Leo Stevens for the longest flight by a practical model at any official contest in 1910, and was officially awarded to Percy Pierce, of 100 East Morningside avenue, New York, at the last contest of the season held under the direction of the West Side Y. M. C. A. on December 31. The flight which won the cup was actually made on December 3, when the model flew 222 feet 7 inches, which may be considered the official American record distance. This same model is said to have made an official flight in the open air of 295 feet and an unofficial one of even 340 feet.

Percy Pierce is but sixteen years of age, but has built up a considerable business making models. One of his types is very well known and is called the "Percy Pierce Flyer."

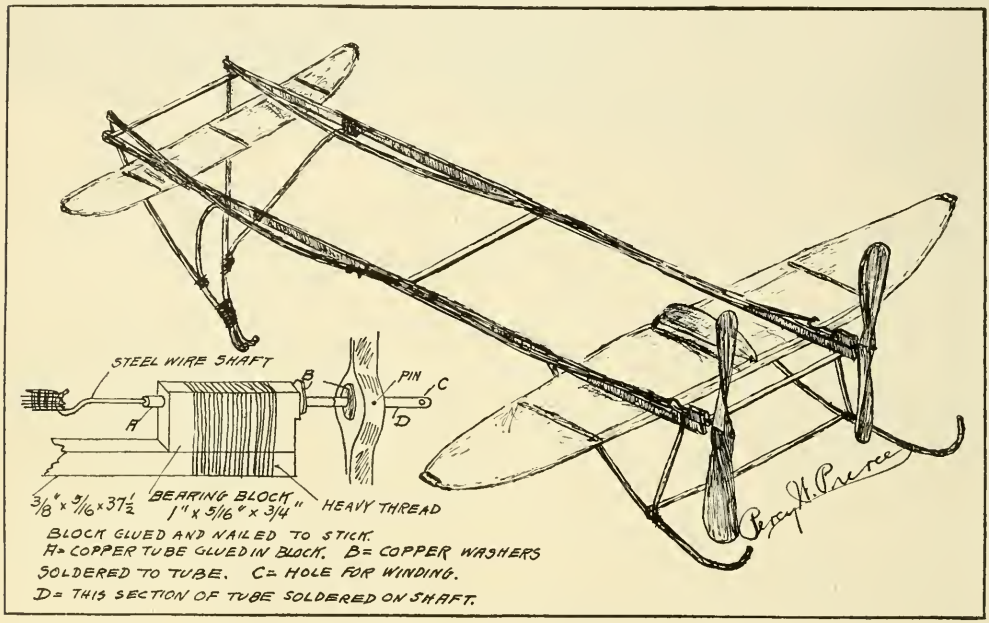
Frederic Watkins and Frank Schrober were very close up, their models doing 221 and 215 feet respectively.

F. L. Herreshoff, who is not a boy "by a long shot," had a beautifully constructed model whose flight was unofficially observed and measured as 234 feet 6 inches.

These contests will be continued during 1911 by the West Side Y. M. C. A., 318 West Fifty-seventh street, New York, for which two cups have been offered. One is a second cup by Leo Stevens to be competed for under similar rules as in 1910. Charles Ragot, a sculptor, has also presented a bronze placque to be awarded the machine exhibiting the best lifting power in any official flight in 1911.

THE PERCY PIERCE FLYER.

Percy Pierce's model monoplane is 37½ inches long overall. The longitudinal members are spaced 8½ inches apart. The front surface is 22 inches spread by 5 inches in depth, while the rear one is 30 by 7 inches. The small rudder is 2 by 7 inches. The main sticks are



The Winning Pierce Model.

⅜ by 5/16 inches, cross section, 37½ inches long. The 8⅜ inches diameter propellers are mounted on steel shafts which run through the bearing blocks (1 inch by 5/16 inch by ¾ inch).

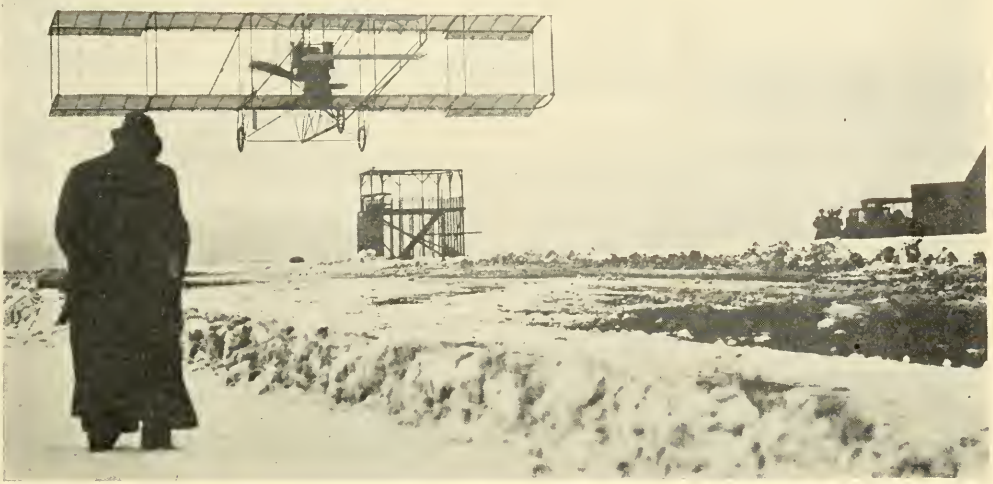
Rubber strands ⅛-inch square are obtained from the E. J. Willis Company in 35 feet lengths. Each power plant consists of a length of rubber 24 feet long (two pieces tied together), wound around the hooks at each end and tied.

The propeller end stands 5 inches off the ground while the other stands 11 inches high. The back skids are 15 inches long and the front ones 13 inches long.

J. C. Mars is no longer with the Curtiss aviators. At last reports he was in Hawaii. Lincoln Beachy started with Curtiss at the Los Angeles meet, flying the regular 8-cylinder machine.

Edward E. Harbert, president of the Illinois Aeroplane Club, of Chicago, has offered $1,000 to any aviator who will carry him the 60 miles from Chicago to St. Joseph or Michigan City. Open for 30 days.

FLIGHTS ABOUT THE COUNTRY



Geo. Thompson Making First Flight, Mathewson Machine.

FIRST COLORADO 'PLANE FLIES.

By Robert A. Donaldson.

THE flights at Denver's mile-high Speedway of the Thompson-Van Arsdale biplane seem to be the first by any home-built aeroplane in the State of Colorado. J. C. Mars had trouble on account of the altitude here and so did Paulham.

January 4th George Thompson (not Van Arsdale, as elsewhere reported) cleared off the snow for starting and landing. He made a circuit and came back to the start all right. In the afternoon he circled the whole motordrome in a flight lasting four minutes.

The Thompson-Van Arsdale machine was constructed for E. Linn Mathewson, a local auto dealer and an ex-race driver, who has ordered four more machines like this one. Mathewson first became an aero enthusiast in the fall of 1909 when, with E. M. Marr, he constructed his first machine. This failed, partly on account of the inexperience of the builders, and partly on account of engine and propeller inefficiency. They sold that machine to L. E. Pine, who is now having success with it. In November of 1910, Mathewson contracted with the Thompson-Van Arsdale Company for the construction of this machine. The machine has already been flown in private, to the entire satisfaction of the builders, but on account of the adverse weather conditions lately, they have not been able to give it a public trial.

The machine is built somewhat on the order of the Curtiss. A 1911 Elbridge engine is used. This is of the 40 h. p. type. It is mounted directly behind the aviator, as in the Curtiss. El Arco twin radiators are mounted on each side of the aviator's shoulders, the lower part of the radiator being about even with the aviators head.

A Gibson 6-foot propeller is used. This is built specially for high altitude, and is guaranteed to give 300 pounds thrust at 1,200 r. p. m. It has a 4-foot pitch. Naiad cloth is used in a single layer for the surfaces. The machine has about 400 square feet of surface, and weighs, with aviator, about 550 pounds.

The ailerons are of the Farman type. These are fastened on by means of head screws and a rod running through, and have two braces between. Both sides work together.

The main pieces are of sugar pine. The small ribs are of three laminations, and large ones six laminations. These are made of two strips of sugar pine, with one of ash between.

The engine base is of ash (2 by 4's). The running gear is the same as Curtiss's except that the front wheel is further forward than on the Curtiss.

The control is by a single wheel, which moves forward and rear, and left to right, the same as in the Curtiss. This controls the elevator, and the turning. A shoulder fork controls the ailerons. This is one of their own design. A quadrant mounted near the wheel, which moves front and back with it but not right and left, controls the spark and throttle. A kick switch is used to shut off the engine.

The Thompson-Van Arsdale Company is located at 1640 Broadway, Denver, and is to build machines for the market.

Several other machines are under construction in Denver, one of which is ready for flight. There are also many persons, enthused by the Wrights' exhibition, who are thinking of building.

THE MATHEWSON BIPLANE HAS SMASH

The Mathewson biplane which had its trial flights about two weeks ago, on January 11, fell from about 100 feet, completely demolishing the machine, but did not hurt the aviator or the engine. Their Requa-Gibson propeller was broken to bits.

The machine was rolled out of the shed about 2 o'clock. The machine rose for its first flight about 2:15, and circled the course once. The course is about 3 1/3 miles in circuit. Upon returning from this flight, in a few minutes the machine rose for another flight. This time it circled the course twice, nearly 7 miles. The machine got off the ground very quickly, and flew at great speed. On these flights the machine flew faster than

it ever has before, the speed being estimated at 58 m. p. h. The third time the aviator, Mr. Thompson, went up, he circled the course five times, about 16 miles. He was flying at about 150 feet above the ground. He started to come down in a figure 8.

All of a sudden, one of the front supports gave way, and the machine turned and dashed toward the ground. The machine hit the ground with a crash, throwing the aviator out of his seat. The impact tore the engine loose and it crashed forward just over the aviator's head. Mr. Thompson considers himself lucky to escape with his life.

What was left of the machine was packed up and taken to Pueblo Colo., where exhibition flights were given Sunday.

The company had on hand at the time of the accident, enough spare parts to replace the old ones.

MORE FLYING AT COLLEGE PARK.

Since November 14th, the last account published in the January issue, the Rex Smith Aeroplane Company has been very active. In spite of a foot of snow and much severe weather operations have been continued with the result that the headless biplane has made 137 flights, each one better than the first.

Antony Jannus, engineer and aviator for the Rex Smith Company, has made three notable flights in the snowy weather. On December 15 he flew during a blinding fall of snow and was so handicapped that the landing, although at the starting point, was made in a heavy drift of snow which resulted in a cracked propeller.

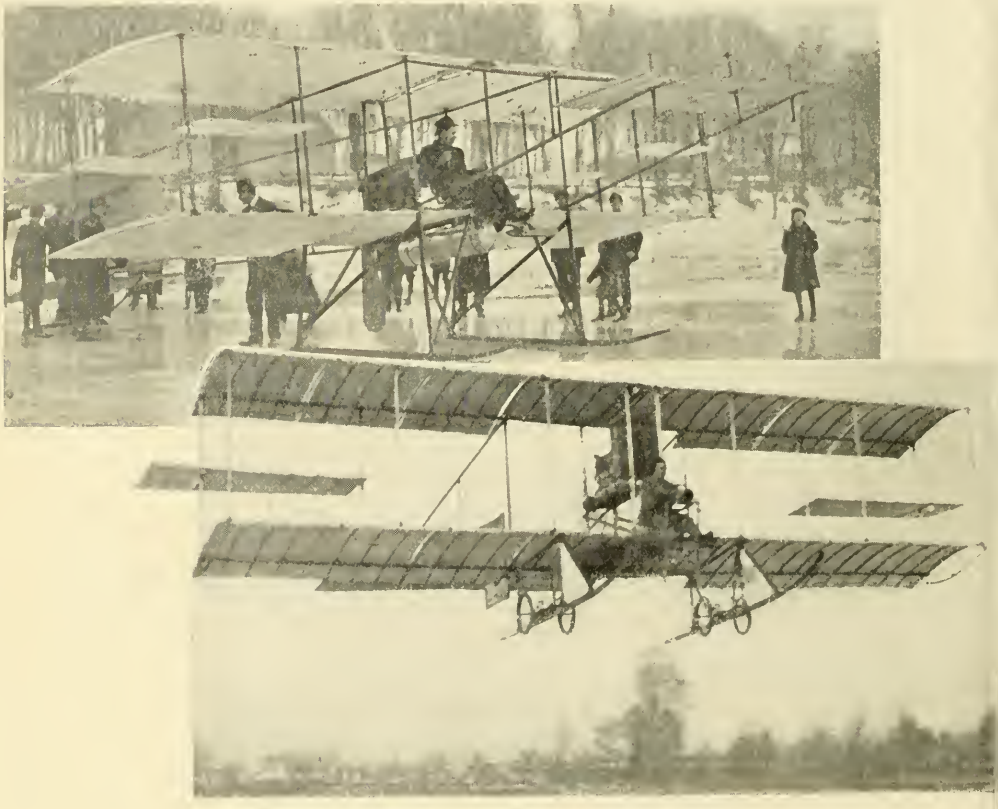
Four days later, the weather having moderated, Jannus made a speed lap of a mile and a quarter in one minute ten seconds, which is pretty fast for a small circle. This was with a new oak, 5.92-foot pitch, 9-foot diameter propeller.

The third interesting performance was when Jannus alighted in some deep snow across the field from the shed and let the motor stop in order to assure himself that the propeller had clearance, then got out and cranked up again unaided and flew out of the snow, and around the field, although the propeller used was 8 feet 6 inches, instead of 9 feet and of white oak, the experiments in the snow have worn the ends badly.

The Rex Smith machine usually uses a 9-foot Paragon propeller, 5.92 pitch, which the six-cylinder Emerson has no trouble turning 1,100 to 1,150 r. p. m., giving from 500 to 560 pounds thrust. The continuous torque of the engine and the 22 pound propeller are very free from vibration, although the whole machine weighs but 875 pounds ready for fuel and operator. In a twenty-eight minute run at full speed with this propeller the fuel consumption was 2.75 gallons of mixed oil and gasoline.

In subsequent flights on balmy days of the first week in January, Jannus cut a figure 8 in a very short distance, ascended to about 200 to 250 feet and flew across country toward Riverdale for a mile or more. He also tried skimming his wheels on the thin ice covering the ponds about the field and only went through for a slight splash on one occasion.

Rex Smith and F. L. Fox are getting out two new designs which are to embody some of the new features which have been studied on the present machine.



Rex Smith Machine in Flight—Parker Biplane.

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Judge the Goodyear by the fact that these aviators have equipped their own machines with it: Capt. Thos. Baldwin, Charles K. Hamilton and all of the International Aviators, Inc., J. A. D. McCurdy, Clifford B. Harmon, Harkness, Wilcox and scores of other famous American and foreign aviators.

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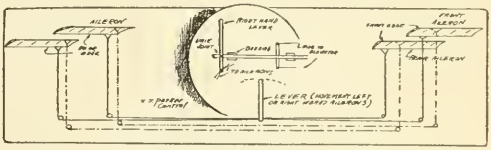
MASSON FLIES 60 MILES CROSS COUNTRY.

Didier Masson, who just flew various Curtiss type machines at Mineola, flew the N. C. Addosides machine (Curtiss type), purchased by Addosides at Mineola and taken to Los Angeles, from Los Angeles to San Bernardino, 60 miles as the crow flies, with a Hall-Scott 60 h. p. motor, 5 hours 40 minutes after leaving Los Angeles on January 7. His actual flying time was 1 hour 20 minutes. He became lost and had to land 12 miles from the finish. After repairing a slight damage he finished his journey, begun with a bundle of "Los Angeles Times" as freight. A regular schedule was laid out to stop at Pomona on the way, leaving some of his papers, then go on to San Bernardino, give exhibitions and return to Pomona, giving an exhibition there. When he became lost he gave up trying to get to Pomona. In San Bernardino he gave an exhibition.

On January 1 and 2, he made exhibition flights at Santa Barbara. These were the first ones since receiving the new engine. He flew high, off out of sight along the mountain range, and back, circling at a height of 3,000 ft., then gliding to earth. On one flight he landed in the garden of a hotel. No time was lost after leaving here in preparing for the newspaper delivery flight for the Los Angeles "Times."

Starting (on skids) from the ice of a lake, a flight of a mile and return was made. Later wheels will be attached. The motor is a four-cylinder, two-cycle, air-cooled, 5x5, of his own make, weighing 196 pounds and has no aluminum parts. This drives an 8-foot by 4-foot propeller which gives 350 pounds push at 1,050 r. p. m.



J. J. Parker Aileron Control.

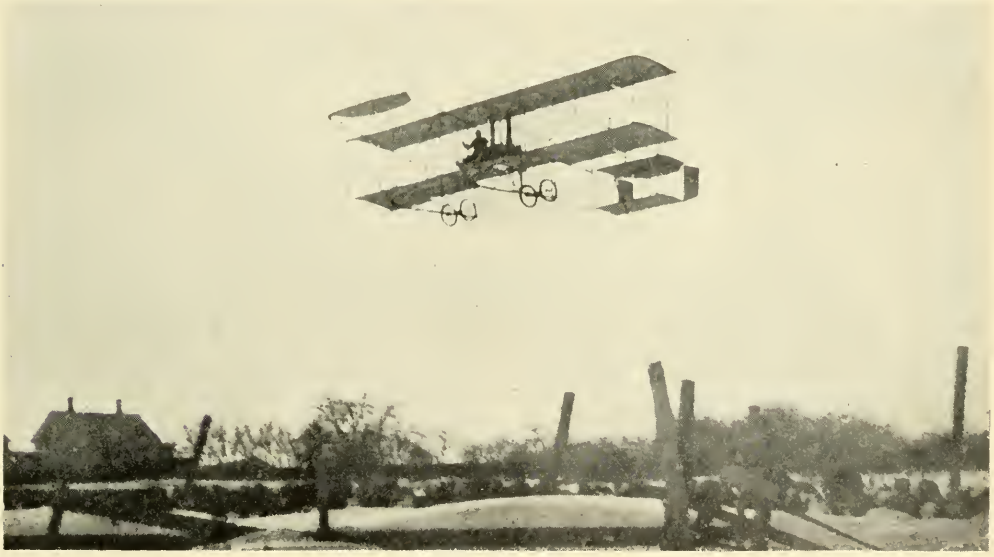
The entire 'plane is of ash, 28 feet spread by 6½ feet; box tail, 6 by 6 feet; horizontal rudder, 3 by 12 feet. All surfaces are covered both sides. Ailerons, 14 inches by 5 feet; rear rudder, 4 feet by 5 feet.

NOVICE FLIES IN PHILADELPHIA.

Harry Parkin, with a biplane of the Curtiss type, equipped with an engine of his own construction, succeeded in getting off of the ground, on January 6, and made a flight of about 150 feet, at the Point Breeze race track. A gust of wind brought him down, damaging his machine, but Parkin escaped injury. He will rush repairs on the aeroplane and expects to try it out again in a few days.

Charles Dorian, in a biplane of his own make, the property of J. Fred Betz, 3rd., made a short flight the same day and landed safely.

JOHN TREVOR CUSTIS.



Wm. Hilliard Flying New Burgess Model "D."

EVANS FALLS 400 FEET.

After making some beautiful cross-country flights at Larned, Kan., in December, William Evans, of 1428 Charlotte street, Kansas City, dropped from a height of 400 ft., when a battery wire gave way, and escaped unhurt. He started from the fair grounds and flew east about a mile, then turned and flew west for three miles. Turning again he started back for the starting point. He was traveling fast at a great height when the machine fell. Evans kept his presence of mind and managed to control the machine until he was within 75 ft. of the ground, when the wind caused it to plunge head-first into a wheat field. The Greene machine was badly smashed but Evans escaped with a few bruises. The Elbridge engine was not injured.

NOVICE BUILDS 'PLANE, MOTOR AND FLIES.

James J. Parker, of Fulton, N. Y., has made his first trial and successful flight with a machine completely of his own construction.

HILLIARD FLYING NEW BURGESS MODEL.

William M. Hilliard has made the first flights with the new model D biplane of the Burgess Company & Curtis and on the second day took up passengers. The load in some of the passenger trips approximated 400 pounds and on two occasions more than that. Hilliard, who is a very prudent operator, took the machine to Ipswich, Mass., where the ground is poorly adapted to practice flights of a greater extent than straight-aways. The photographs show some of the obstructions but the grounds are cut up into small fields.

(Continued on p. 74)

AEROPLANES EN TOUR

Evans in his Greene Biplane over Kansas Town

Atlanta, Ga., Dec. 15-17.—A very successful aviation meet was given here three days beginning December 15 under the auspices of the Atlanta "Journal" and under the management of the Curtiss Exhibition Company. J. A. D. McCurdy, Eugene Ely and James J. Ward were the competing aviators. Ward surprised the crowd by his high flights in his 4-cylinder Curtiss, while Ely and McCurdy raced each other and conducted bomb dropping tests. Races with automobiles driven by local men were features of the meet.

Dillon, S. C., Dec. 21.—J. A. D. McCurdy, with his Curtiss racing machine, gave a number of exhibition flights here with an audience which outnumbered the town's entire population Although the last census gave the town but 1,019 souls, McCurdy received his usual rate of $1,000 for the day's flights.

Norfolk, Va., Dec. 23.—Under arrangement with the "Ledger-Dispatch" of Norfolk, J. A. D. McCurdy, using Glenn H. Curtiss's Hudson Flyer, made a picturesque flight over the city and water front here remaining in the air more than 20 minutes.

Charleston, S. C., Jan. 3-6.—"Jimmie" Ward was the hero of the Charleston aviation meet as a result of his 40-minute flight over Forts Moultrie and Sumter in his 4-cylinder Curtiss biplane. He landed on the beach in front of Fort Moultrie and delivered a message to Col. Marsh, the commander. Returning, he flew over the Island of Palms, Castle Pinckney, Sumter and the village of Mount Pleasant, besides going about a mile and a half out to sea. He crossed the Cooper and Eando rivers, and attained an altitude of 5,300 feet according to his barograph. McCurdy, who took part in this meet, gave his attention to exhibition flights, spiral glides, and racing, with automobiles as his opponents.

Fresno, Cal., Dec. 16-18.—G. H. Curtiss, Charles F. Willard and J. C. Mars flew.

Shreveport, La., Jan. 14-15.—Two-day meet with McCurdy and Ward with their Curtiss machines participating.

Tupelo, Miss., Dec. 19-20.—International aviators gave a two-day meet. Moisant flew in a snowstorm and gale.

New Orleans, Dec. 24-30.—The death of Moisant closed the meet given by the International Aviators the morning of the 31st.

SIMON MAKES MILE RECORD.

On December 23 Rene Simon flew around the New Orleans mile track in 57 sec., which is 63.16 m. p. h., a record for a mile track. This was timed by the New Orleans Aero Club.

Moisant flew for 46 min. 10 sec., manoeuvering over the heart of the city of New Orleans, on December 24, the longest over-city flight ever made, and the first over-city aeroplane trip on record where the aviator did not fly as quickly as possible from or across the built-up sections. He flew in a 60-mile wind on December 29 at New Orleans for 26 min. 22 sec., his machine at one time standing stock still for six minutes, and at another period of this flight being blown backward for three minutes, despite the fact that his normal speed is fifty miles an hour.

In thirty flying days, ending Dec. 31, the six aviators, Moisant, Simon, Barrier, Garros, Frisbie, Audemars and Hamilton, flew a total of 64 hrs. 18 min., and not a wind check was given out. At 50 m. p. h. the distance flown was more than 3,200 miles, equal to a transcontinental flight in length.

Five cities, Richmond, Chattanooga, Memphis, Tupelo, New Orleans, have been covered since the start. From Dallas they go to Ft. Worth, Oklahoma City, Waco, Austin, Houston, Galveston, Havana and Santiago. The problematical route is then Matanzas, San Juan (Porto Rico), Nassau, Jacksonville and Mobile. A meet in New York is promised for the spring.

BARRIER UP 6,000 FEET.

Dallas, Jan. 4-9.—Simon and Barrier were the stars of this meet, which had one day of no flying. Barrier flew over the city one day, and on another flew up more than 6,000 feet.

Pueblo, Colo., Jan. 15.—Three short exhibition flights were made by George Thompson in the Mathewson biplane, but these were not very long on account of the poor grounds. On one of the flights the machine rose in 110 ft. of start. Exhibitions are to be given at Trinidad and Grand Junction, as these are booked for flights during the weeks of the 15th and 20th.

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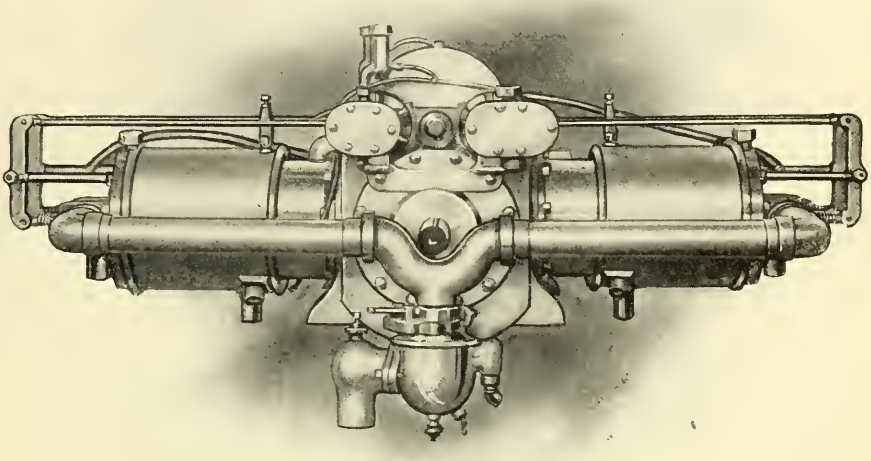

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LAST DAY OF 1910 CLAIMS TWO VICTIMS

Death of Arch. Hoxsey.

On coming down after reaching an altitude of 7,200 feet, on December 31, at Los Angeles, Arch. Hoxsey, one of the very best flyers of the entire world, lost control of his machine, possibly through heart trouble, or some other physical ailment, and was killed. In the account of the Los Angeles meet elsewhere in this number more details are given.

"From everything that can be learned concerning Mr. Hoxsey's accident, it would seem," said a competent expert who is conversant with the Wright machine, "that it was caused by a lapse in his physical condition, caused by his continuous altitude work. This seems to be the opinion of those who witnessed the accident. He was descending at a very steep angle when he first came in sight. This angle increased to an abnormal degree when less than 1,000 feet from the ground. The machine then wavered sideways slightly, which would appear that it was not being operated."

Archie Hoxsey.

Arch. Hoxsey was born at Staunton, Ill., October 27, 1884, and at the time of his death was 26 years old. He was the son of Archibald Hoxsey, a native of Illinois, and Minnie Eckles, a native of Pennsylvania. At the age of 7 years his father died, since that time and until his death he lived alone with his mother. When he was 9 years old he and his mother came to Los Angeles County, living for three years at Glendora, afterward moving to Pasadena. He attended the Garfield school until he was old enough to work. When but a small boy he worked at odd jobs, and was well known to a large number of people. Later he became a machinist and chauffeur, which gave him still further acquaintance. In the spring of 1910 he joined with the Wright Co.

He was fifth at Belmont in amount won, $6,908. His altitude flights at Belmont were 5,796 ft., 4,882 ft., 6,233 ft., 6,903 ft., 5,146 ft. Here, with Johnstone, he flew in a wind that drove him backward, landing 25 miles behind. The wind was estimated, at the altitude of 7,000 ft., at 80 miles an hour. At Baltimore meet he glided down in the little Wright from 5,330 ft. with engine stopped. Here he did

wonderful flying daily in heavy winds, when no one else would fly. He held the American cross-country record of 89¾ miles, from Springfield, Ill., to Clayton, Mo., and made a new American duration record of 3 hrs. 16 min. 50 sec. at Los Angeles meet.

Arch. Hoxsey's body was taken to Pasadena, the home of his mother, and cremated.

The funeral services were conducted in a little mortuary chapel on a foothill overlooked by the peak of Mount Wilson, which Hoxsey surmounted when he attempted to beat his own altitude record of 11,474 ft. While the service proper was attended by only a few friends, thousands stood about outside. It required more than an hour for the crowd to file by the casket.

Moisant Falls from Machine.

John B. Moisant, American aviator, head of the group now touring under the name "International Aviators," was filling an engagement at New Orleans. On December 31 he flew from the exhibition grounds to another field a few miles away in order to compete for the Michelin prize and trophy for the greatest distance flown in 1910, there being on hand for the purpose an official observer.

He was making a preliminary flight and was attempting to land with the wind with the motor dead. A sudden puff of wind lifted the tail up and threw Moisant out thirty-two feet ahead of the machine, breaking his neck. The machine then toppled over.

A thorough examination was made of the machine which Moisant used, and all witnesses were asked to describe just what they saw the monoplane do. Every statement agreed upon two points: First, that Moisant attempted to land when apparently no necessity arose for his landing at that particular moment or at that particular point; second, that when he started to land he was flying with the wind.

The inevitable conclusion is that something went wrong inside of the Bleriot, something of importance, that regardless of the danger of a landing, Moisant was compelled to seek the ground.

The funeral was held January 2, and the body deposited in a vault for future transportation to the Moisant home. His estate,

estimated at more than $100,000, will be held in trust for his son, who is now at school.

John B. Moisant, who was universally conceded at the time of his death at New Orleans on December 31 last to be one of the greatest monoplane fliers in the world, was born in Chicago, Ill., on April 25, 1873. He spent the first fifteen years of his life in and around Chicago, completing a high school course there, and then with his brother, Alfred J. Moisant, and his three sisters, moved to Alameda, Cal., where the family made its home for the next eight years.

John Moisant and Alfred Moisant then went to Central America, where they commenced to establish large business interests, particularly in San Salvador, the capital of Salvador. They worked hard and prospered greatly, and inside of ten years had acquired 40,000 acres of fine sugar and farm land, had organized and successfully operated the three strongest banks in Central America, and had acquired many other valuable possessions in Mexico, Nicaragua and Honduras.

Despite the many stories that have been circulated relative to the "filibustering" career of John Moisant, there is not one word of truth in any of them. The only time that he ever engaged in so-called "revolutionary" exploits was in order to liberate his brothers, George and Edward, who had been imprisoned by President Figueroa, of Salvador, who coveted the Santa Emelia and Santa Ana ranches and other Moisant properties. Finding, it is said, that the United States government would not protect American citizens residing in Central America against the outrages of some of the local politicians, John Moisant organized and headed a small army of 500 poorly clad and poorly armed natives, and with this small force marched against the capital of Salvador, in order to liberate his imprisoned brothers. He captured the port of Acajutla and the city of Sonsonate without losing a man, although he inflicted terrific losses upon the 6,000 government troops drawn up to oppose him.

Shortly after capturing Sansonate his untrained troops became suddenly, and for some still unknown reason, panic-stricken, and refused to proceed further, so that John Moisant was compelled to abandon this attempt to free his brothers. He persisted, however, for the ensuing two years, and finally became strong enough to compel Figueroa to liberate the two innocent men after they had languished in the Salvador jail for two years. But there was not, and never had been, any idea in John Moisant's mind, or in the minds of any of his three brothers, to upset any of the established governments for personal gain, or for any other reason than above.

John B. Moisant and his brother Alfred had been accustomed, during their residence in California and Central America, to watch the great soaring birds, like the gulls, hawks, buzzards, vultures, and even the albatross.

Before John Moisant had ever seen an aeroplane he had planned and had under way the metal monoplane, which will now be manufactured by his brother. Shortly after completing the plans for this metal machine Moisant went to France and visited every aviation meet held in Europe in 1908 and 1909. He was the first man who argued for a rotary motor on a monoplane, although Bleriot himself said that to attempt to put a rotary motor on a monoplane would be to invite instant destruction. He bought the first Gnome engine ever turned out by the Gnome factory, and immediately installed it on the metal machine which he had by this time completed except for its power plant. The machine was finished and the engine installed in a factory at Etampes.

He found that his machine not only came up to his expectations, but exceeded them. He had always been a believer that in speed lay safety, that the faster one flew the safer one was. His machine developed a speed of 80 miles an hour instead of only the 60 that he had figured on, and Moisant found out within a few seconds after he had left the ground for the first time that he was entirely incompetent to handle his aeroplane.

Having attained a height of 100 ft. from the ground, and being still bent heavenward with apparently no chance of changing the course of the machine, Moisant deliberately cut off his engine and allowed his machine to fall to the earth.

As a result of the fall only the metal tail of the machine was broken, and Moisant himself escaped without a scratch. He determined then that it would be necessary for him to learn in a slow machine.

After making three short flights in the 50 H. P. Bleriot passenger-carrying machine which he then bought, he immediately won his pilot's license from the Aero Club of France the second day he had this monoplane in his possession. On August 17, 1910, he flew from Etampes to Issy les Moulineux, a distance of 37½ miles, straight above the heart of Paris, carrying as passenger Roland G. Garros, who later became a team mate of John B. Moisant with the International Aviators. This was only the fourth time that Moisant had flown.

A few days later Moisant started late in the afternoon from Paris for London, carrying a 185-pound passenger, besides 300 pounds of gasoline, lubricating oil and tools. Flying over country that he had never before visited, and guided solely by his glycerine-floated compass, Moisant reached Amiens the first day and remained there over night. He then flew to Calais, where he again landed.

From here, in a bad wind, he flew across the Channel to Dover, but was blown eastward to Deal, at which place he landed, having arrived on English soil the second day out from Paris, with only two landings intervening between the French capital and Deal. Then the machine which had carried him so far developed one flaw after another, and Moisant was two weeks completing his journey to the English capital, which lay only 30 miles from Deal.

He was the first man ever to fly from the French to the English capital; he was the first man to carry a passenger from Paris to London; he was the first man to carry a passenger across the Channel; and he was the first man who had ever, in all the history of the world, reached London in the same vehicle as that in which he left Paris.

At the last moment, as a substitute in the American defending team, he jumped into the race for the international trophy at Belmont Park on October 29 last, and won second place for the United States. In a 50 H. P. Bleriot, in which he had never sat until he started out in that race, he won over Grahame-White in a 100 H. P. Bleriot, the $10,000 Statue of Liberty prize on the following day.

Short biplane

Death of Cecil Grace.

Dover, Eng., Dec 22.—Cecil Grace (Short biplane) left Dover in competition for the Baron de Forest prize. He landed in France at Las Baraques, near Calais. The wind being bad, he decided to fly back to Dover and wait for a better opportunity. He left ahead of the boat that was to follow and became lost in a heavy fog. Several vessels reported seeing the machine or hearing the engine. No word has since been received nor has the machine been found. A cap and goggles were found many days later on the Belgian coast. These were identified as belonging to the unfortunate aviator.

Issy

Fatal Accident to Laffont and Pola.

Shortly after leaving the ground, in making a preliminary flight in his Antoinette before attempting the flight to Brussels, at Mourmelon, on December 28, Alexandre Laffont and his pupil, Mario Pola, in a bad wind, one of the wings was wrenched entirely loose from the machine and both men were killed. An eye-witness reports that a gust of wind got under the wing and the aviator was trying to right the machine and was making a sharp turn. The pressure was too great for the structure.

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The aeroplane that has proven itself to be safe, practical and always ready. The only machine built to accommodate two people comfortably. Holder of the World's Record for Slow Flying, Quick Turn and Accuracy of Landing; and American Record for Long Distance Cross Country Flights, Duration, Distance and Altitude.

At the recent Harvard-Boston Meet at Atlantic, the Wright Flyer, in competition with Bleriot, Farman, Curtiss and other machines, took first prize in duration, distance, altitude, accuracy of landing, slow flight and the Hammond Cup for bomb throwing.

Planes, propellers and motors built entirely in our own factory. Write us for terms and delivery date.

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This picture shows one of the rooms in the Cloth and Wheel Department of the Aeroplane Factory of the Elbridge Engine Company, Rochester, New York. It shows also the stock of tires to equip the planes built here.

3" PALMER AEROPLANE TIRE

Manufactured by **THE B. F. GOODRICH COMPANY**
AKRON, OHIO

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AIRSHIPS, BALLOONS, AEROPLANES

VULCANIZED PROOF MATERIAL

Aeroplane Fabric a Specialty

All Curtiss, Mars, Willard, Hamilton, Shriver, Russell, Seymour, Burgess Co. & Curtis, Frisbie, and all the best fliers have their Aeroplanes Covered with Vulcanized Proof Material. :: Use Vulcanized Proof Material and Win

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Lahm Balloon Cup—697 Miles. Forbes and Fleischman, Balloon "New York"

Best Duration Indianapolis Balloon Race—35 Hrs., 12 Mins. Forbes and Harmon, Balloon "New York"

U. S. Balloon Duration Record—48 Hrs, 26 Mins. Harmon and Post, Balloon "New York," St. Louis Centennial

U. S. Balloon Altitude Record—24,200 Ft. Harmon and Post, Balloon "New York," St. Louis Centennial

Gordon Bennett Aviation Prize
30-Kilom. Aeroplane Speed Prize
Grand Prize of Brescia for Aeroplanes
Quick Starting Event at Brescia
2nd, 10-Kilom. Aeroplane Speed Prize
2nd, Brescia Height Prize—Glenn H. Curtiss

New York World Prize, $10,000—Albany to New York. Glenn H. Curtiss

New York Times Prize, $10,000—New York to Philadelphia and return. Charles K. Hamilton

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USED IN THE U. S. GOVERNMENT DIRIGIBLE AND SPHERICAL BALLOONS

WILL last fro five to six times as long as a varnished balloon. The weight is always the same, does not require further treatment. Heat and cold have no effect on it, and sions can be made as well at zero weather as in the summer time. The chemical ac n of oxygen has not the same detrimental effect on it as it has on a varnished mate al. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the stre th of varnished material. A man can take care of his PROOF balloon, as it requires li e or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 l . per inch width. Very elastic. Any weight, width or color. Will not crack. W erproof. No talcum powder. No revarnishing. The coming balloon material, and which through its superior qualities, and being an absolute gas holder, is bound to take the lace of varnished material. The man that wants to have the up-to-date balloon must h VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

Prices and samples on application

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NEW YORK

Aviator Loses His Life in Brazil.

San Paulo, Brazil, Dec. 28.—Jules Picollo was killed by being thrown from his monoplane when it suddenly pitched forward at a height of 400 feet.

Military Aviator Has Fatal Fall.

Versailles, France, Dec. 30.—Lieut. Caumont, French army aviator, who had just taken up the Nieuport machine, after having been already proficient in Farman, Sommer and Bleriot machines, met his death in a final flight before competing for a two-man speed prize. His accident was ascribed to trouble with the steering. He attempted to glide down, but was thrown out.

Croatian Aviator Is Killed.

Belgrade, Servia, Jan. 9.—Roussijan, a Croatian aviator, was killed after making a flight across the River Save.

The Death of Picollo.

FURTHER particulars regarding the death of Picollo at San Paulo, Brazil, are now to hand from his mechanician, Paul Rugere. It appears that the aerodrome was a very small one indeed, and, on landing from one of his flights, Picollo vaulted out of the machine, intending to hang on and so bring it to rest in the manner adopted by Leblanc. Unfortunately he stumbled and fell under the machine and his head was caught by the lower end of the mast to which stay wires were attached. The injuries sustained were so serious that Picollo died within a short time.

HIGH FLYING

Monoplane Mails

...e 18 centimeters; the pulse was 70. ...after a flight of 25 minutes, during ...e twentieth minute he reached the ...100 meters, the constant pressure ...imeters of mercury and the maxi... ...ssure 19 centimeters; the pulse was 80. This increase in pressure is all the more remarkable as the aviators were athletes in full training. The rise was less marked in aviators who were fatigued. These showed palpitation of the heart and marked acceleration of the pulse (108). In one case troublesome tachycardia, symptomatic of functional insufficiency of the heart, and vertiginous movements, were observed in an aviator who, after a flight of an hour, had reached the height of 1,000 meters. No rise in blood pressure was found in aviators who flew at low altitudes, such as 100 to 150 meters.

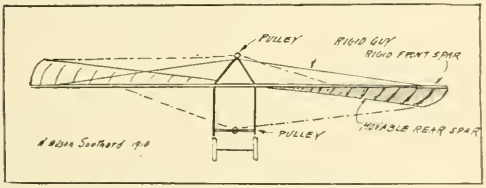
...equally new ...physiological effects upon the ... seems to have attracted little notice. On rapid ascent to great altitudes exposes the body to conditions different from any terrestrial ones. Mountain climbing offers some analogy, but it differs in the fact that the transition from the high atmospheric pressure of the sea level to a low pressure takes place much more slowly.

"In the 'Gazette Hebdomadaire des Sciences Medicales de Bordeaux' of September 25th Professor R. Moulinier has reported some interesting observations on the blood pressure of aviators who have ascended to high altitudes. On alighting after ascending to a height of 1,200 to 2,000 metres the aviator presents cyanosis of the extremities, probably from the low temperature of the high regions of the atmosphere. Often there is congestion of the conjunctivæ. The pulse is slightly accelerated, but there is no palpitation, arrhythmia, or epistaxis. There is often slight and transient headache and tinnitus aurium. Sometimes there is a tendency to sleep, and this may be felt even during flight. After the flight the blood pressure is always increased.

"In one aviator at 5.30 p. m., before flight, the constant blood pressure in the radial artery was found with Pachon's sphygmometer to be 9 centimeters of mercury and the maximum

"As to the cause of the rise in blood pressure, Professor Moulinier puts forward the hypothesis that it is due to the sudden descent to the earth in four or five minutes from a height of 1,000 to 2,000 meters, which was attained in 20 to 25 minutes. At a height of 2,000 meters the atmospheric pressure is 591 millimeters of mercury, at the sea level 760 milimeters. In the short time of the descent the circulatory system had not time to become adapted to the change of pressure. He therefore advises aviators to descend more slowly. He also points out the dangerous fatigue to which flight at high altitudes exposes the circulatory apparatus by provoking increased and irregular activity of the heart and vessels. A sound heart and supple arteries are absolutely necessary to an aviator."

W. Wilson Southard, of 421 North Fulton avenue, Baltimore, Md., is in hard luck. After finishing his monoplane and getting the first flights out of it, smashing it, he loaned his motor to another novice flyer just before the latter's shed burned up, or down; anyway, Mr. Southard knows he can fly and he is building his second machine. The late lamented



Southard Automatic Stability.

aeroplane is a big one, the wings being 34½ ft., spread by 6 ft. 5 in. fore and aft, curve 1 in 18. The tail was like that of the Antoinette and it seemed to give added stability to the machine. The motor was a 40-50 motor of the Detroit Aeronautic Construction Co., turning a 7-ft. by 4½ ft. pitch propeller. The weight complete was, with aviator, 635 pounds for 200 sq. ft. in main surface; tail had 72 sq. ft. and movable tail elevator tips 20 sq. ft. For equilibrium he employed a design of his own which consists mainly in the movability of the rear main spars. The front spars are rigidly trussed top and bottom, while the back spar guys pass through pulleys at top and bottom. When th... wind raises one wing the other one lowers... ...d "the extra pressure of the top wing a... ...s automatically helps to shift the press... ...iformly." He has, however, a lever co... ...ing the warping which he uses "constantly, as I have no faith in automatic devices of any kind."

A fine and more comp...te tabulation of the principal events in aeron...tics for 1910, compiled by William J. Ha...mer and Hudson Maxim, with a list of w...d and American records and other valuab... information, is printed in the 1911 WORLD ALMANAC. Be sure to get the "Second Editi...

TOO LATE TO CLASSIFY.

PATENT PENDING on an AEROPLANE capable of ASCENDING and DESCENDING VERTICALLY, and of remaining stationary over, or moving with (battleship), any object. Has all t... speed, strength, lightness and simplicity of a standard aeroplane. The inventor is a well known engineer, for many years employed as designer by some of the largest automobile companies. Liberal terms will be made to capitalists.

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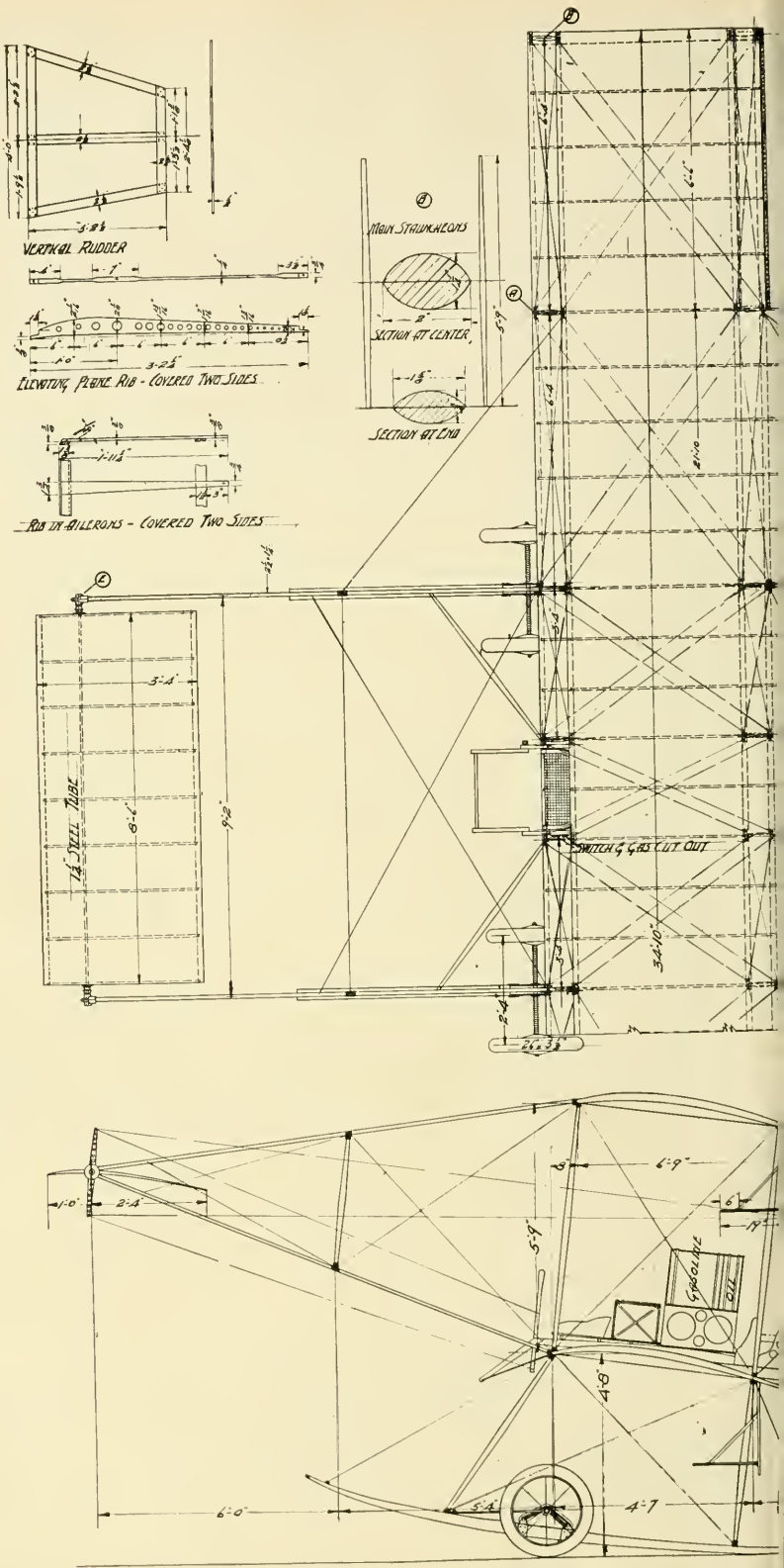
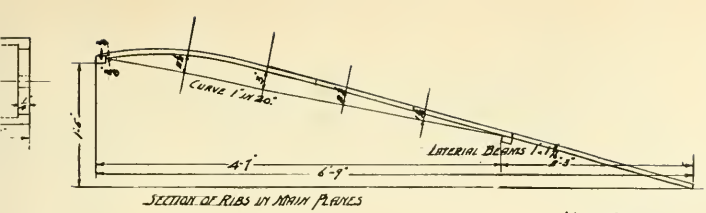
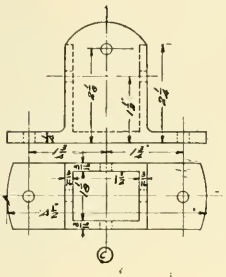
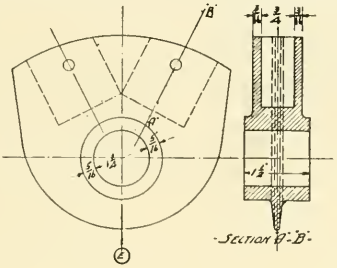
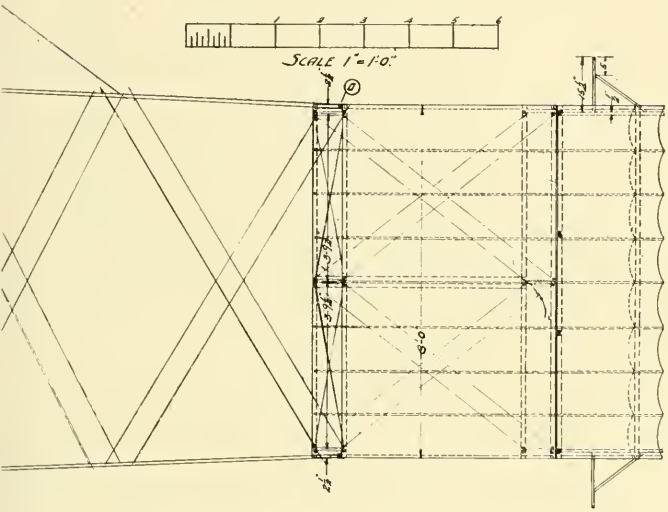

VERTICAL RUDDER
ELEVATOR PLANE RIB - COVERED TWO SIDES
RIB IN AILERONS - COVERED TWO SIDES
MAIN STRUCTURE
SECTION AT CENTER
SECTION AT END
1/4" STEEL TUBE
SWITCH & GAS CUT OUT
GASOLINE
OIL

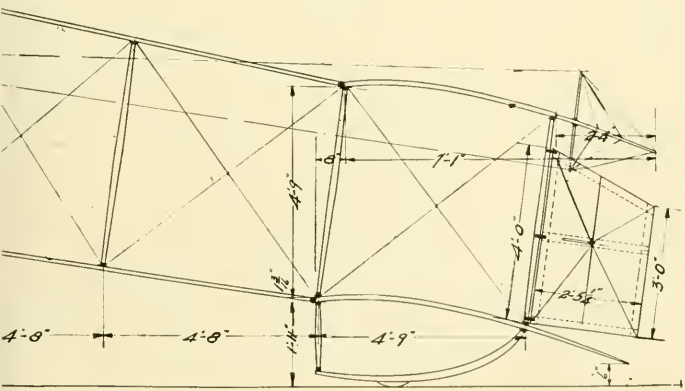


SECTION OF RIBS IN MAIN PLANES









News In General

CONGRESS $125,000 AERO APPROPRIATION.

The House of Representatives passed, on January 18, an appropriation of $125,000 for army aeronautics. Hurrah!

It was a complete surprise, worked neatly as an amendment at the last moment by Mann of Illinois. He is not a member of the military committee at all, but he was loaded with a lot of good aeronautic dope and put the thing through just right in the face of some small opposition from Fitzgerald of New York and Helm of Tennessee, neither of whom knew a flying machine from a threshing machine. They were naturally all at sea and Mann was there with the goods. This means, of course, that the signal corps will be able to do something during the coming summer. They have not yet picked out the machines they will get or where they will put them.

BRITISH SOCIETY SENDS REGRETS.

The Aeronautical Society of Great Britain cabled the Aeronautical Society, at New York, as follows, on learning of the accidents to Moisant and Hoxey:

"British Aeronautical Society deplores loss of two gallant men."

WRIGHT TRAINING SCHOOL STARTS.

Frank Coflyn opened the Wright training school at Monte Sano Hill, Augusta, Ga., on January 16th. This camp will be equipped for the training of purchasers of Wright machines, with the exception of a few men for the exhibition department. No men will be trained excepting those who actually purchase machines or their employees. This training will consist in flying a machine accompanied by the teacher who gradually transfers the control of one lever after the other to the pupil. The Wright Company believes this is a practical way to learn to fly and much more effective than the ground training and special device training used by some of the French schools.

Robert J. Collier has purchased a machine and it has been delivered to him. A number of other orders will be filled during January.

CURTISS SCHOOL OPENS.

Glenn H. Curtiss, accompanied by Charles F. Willard, Eugene B. Ely and Lincoln Beachy, formally opened the new aviation grounds at San Diego, Cal., where Mr. Curtiss will carry on experiments, on January 21 with a two-day meet, all four aviators taking part.

Following the meet, Mr. Curtiss took up in earnest his winter work in experimenting and instruction. The school opened with two pupils, Lieutenant Theodore Ellyson, of the United States navy, who is detailed to the Curtiss camp for this work, and C. C. Witmer, of Chicago, Ill., who is negotiating the purchase of a Curtiss machine for his own use.

Lieutenant Ellyson was detailed by Secretary of the Navy Myer to receive instruction in the manipulation of the Curtiss biplane and to work with Mr. Curtiss in his experiments. He is one of the younger naval officers, and has been for the past three years in the submarine boat service at Newport News. He says that there is only one thing better than submarine work, and that is aviation.

MOISANT SCHOOL ON LONG ISLAND.

The plans which John and Alfred Moisant had formulated for their future careers in aviation, will be carried on now by Alfred Moisant alone. The metal monoplane which John Moisant, in collaboration with his brother, had designed and built, will be manufactured in or near New York City. Several aviation schools will be opened by Alfred Moisant and competent instructors and various types of aeroplanes installed. The first of these will be at Garden City, Long Island, where 1,600 acres, absolutely unobstructed by a tree or house, have been secured for school purposes. In the very near future 100 hangars will be constructed there, and a grandstand will also be erected, so that tournaments may be held at this point. Other schools will be established at New Orleans and on the Pacific Coast. There will also very likely be one in the Central West.

LEGAL AERONAUTICS.

The breach of contract suit brought by Glenn H. Curtiss against Chas. K. Hamilton, who was under contract to fly for him, has been decided in favor of Mr. Curtiss, who was awarded $6,200 and costs, on January 10, at Bath, N. Y. No appeal has been taken as yet from this decision.

Dr. William Green has obtained a judgment in a Hartford, Conn., court for $575 against the Harriman Engine Co., the defendant company filing a $1,000 bond.

The Wright Co. was denied, on technical grounds, a temporary injunction to restrain the Aero Corporation, Ltd., from disbursing funds until $15,000, alleged due the complainant, were paid. This does not reflect on the merits of the case, which will proceed to a trial. The details of this action against the promoters of the Belmont meet were printed in the January number.

LAST CALL FOR MOTOR PRIZE.

Entries close March 31 for the Automobile Club of America's $1,000 motor prize. The conditions are very mild compared with the 24-hour run in the Alexander motor competition in England. An A. C. A. certificate would be a big asset to any motor builder. Write at once for rules and blanks to 249 West 54th street, New York.

DINNER TO WILBUR WRIGHT.

Wilbur Wright was the guest of honor at the annual banquet of the National Geographic Society, of Washington, on January 15.

Gen. Leonard Wood, chief of staff, U. S. A., spoke of the use of the aeroplane in the army. He said that no military man could fail to appreciate that it was a great addition to army equipment, and that as a means of reconnoissance it was destined to play an important part in the next war. He said that unfortunately the American army was at present equipped with but a single aeroplane, and that of ancient type. It would take $75 or $80 to get this machine in shape to fly, but the officer who is in charge of it had assured him recently he hoped to be able to raise this amount by private subscription.

A warm tribute to the work of Prof. Langley, who had risked his scientific reputation in the development of aviation, was paid by Gen. Greely, under whom the money for Prof. Langley's man-carrying aerodrome was expended.

The ices were served grouped around the base of a miniature aeroplane, carried by each waiter. Marching at the head of the procession there was an aviator in full costume with a three-foot model of an aeroplane with a doll

Successful Flight

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2nd National Exhibition of Aerial Craft

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1st. That it is generally acknowledged by those who have attended all the indoor aerial exhibitions in America that last year's Boston Exhibition of Aerial Craft was the **Biggest** and **Best.**

2nd. That any Exhibitor of last year's show will tell you it was of **Financial Benefit** to them.

AND ALL THIS ONE YEAR AGO WHEN THE GENERAL INTEREST IN AVIATION WAS ONLY SLUMBERING

3rd. That this year will far surpass anything heretofore held, and have you an aeroplane, an accessory, a model or an idea, it will pay you to exhibit and attend this exhibition.

WATCH THIS YEAR'S SHOW—DON'T FAIL TO BE THERE

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It is probable that out of such a large stock a propeller may be found which just meets the requirements of any specially designed aeroplane; but even in such a case, in order that a correct choice can be made it is advisable that enquiries should clearly state all particulars of the:

1. Plane surface and head resistance.
2. Horsepower and speed of engine.
3. General design of complete machine.
4. The number of propellers to be used and their greatest possible diameter.
5. The direction of rotation, clockwise, or anti-clockwise, when standing in the breeze made by the propeller.

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The "REGULAR" line now embraces 29 distinct designs, which number will be added to as time and endeavor evolve new combinations of air-vessel features.

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The new **try-out proposition** is for the purpose of offering to an aero experimentet the samefacilities as the engineers of any marine ship builders find essential to enable them to arrive at the most efficient combination of vessel, engine and propeller.

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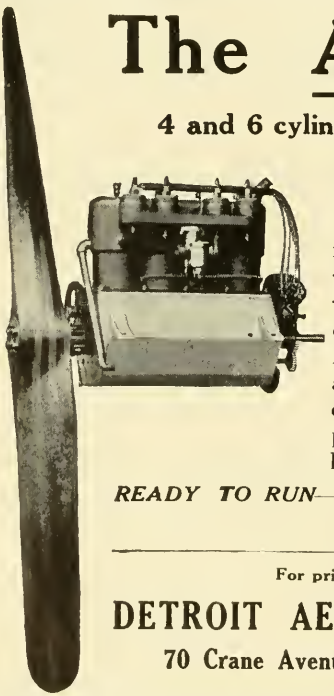

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for operator and the propellers moving. The aeroplane, by the way, was the old Wright model with the front control. This was a technical defect that doubtless grieved Wilbur, but that the diners did not seem to notice.

NO SHOW FOR CHICAGO.

Profiting by the example of the recent St. Louis aero show, held under the auspices of the Aero Club of St. Louis, and which failed to pay all its obligations, the Aero Club of Illinois has decided to give up the idea of a show in March. It is possible one may be held in connection with an aero meet which may be conducted during the summer. The Chicago club is averse to recording failures, and feels the time is not ripe for paying indoor exhibitions.

BOSTON SHOW ONLY MONTH OFF.

As the time approaches for the "Second National Exhibition" of aerial craft in Boston, February 20th to 25th, the interest in this event becomes more pronounced. Manager Campbell is personally deeply interested in aeronautics, so to a great extent the show is a labor of love with him. In fact, last year, in the face of almost unsurmountable difficulties and at great expense gave to the public the biggest indoor show ever held in America, and at the close gave out an interview that while he had expended a number of thousand dollars more than the receipts, still each year he would show to the people of New England the strides that had been made in aviation, with the result that in February the Mechanics Building will again be open, this time with practically all the well known makes of machines that have done such wonderful things to date.

Last year's show was acknowledged by all those who attended as a forerunner of the great strides made and the interest now so plainly manifested in aeronautics, and from all indications, with the interest of the public in the bird-men and their craft and the fine support promised by the manufacturers and accessory dealers, Boston will again see a show that will keep her in the front rank.

Many novelties will be introduced, unique advertising, prizes for model flying, lectures, appropriate decorations and as well a number of the machines that have made records during the past year. A full list of these will shortly be published. In fact everything is being done both in the interest of the exhibitor and the spectator and Manager Campbell is to be congratulated in his endeavors. Models, machines and accessories are solicited and as the building is very large any one who has anything of merit can be accommodated.

For all information address Chester I. Campbell, 5 Park Square, Boston, Mass., and the same will have prompt attention.

W. P. EDGAR.

INCORPORATIONS.

American Safety Aerocar Corp., $1,500,000. Incorporators: W. E. Dennis, Hollis Court, L. I.; C. N. Platt, Astoria, L. I.; H. Kays, Yonkers, N. Y.

Wadsworth Airship Co, Pittsburg, Pa. Cap. $20,000. J. W. Wadsworth, F. J. Schellman, A. W. Henry, E. E. Cramer, J. F. Milliken.

Chicago Aeroplane Mfg. Co., $2,500. Mark E. Grable, Willard D. Hammond, Bruce E. Adams.

Converse Automatic Aeroplane Co., $50,000, Fiske Bldg., Fresno, Cal. Directors are H. H. Darling, F. W. Cameron, J. M. Ash, A. D. Newlin and N. B. Converse.

Southern California Aviation Association, Los Angeles, $75,000. Directors: W. M. Garland, Wm. G. Kerckhoff, Fred L. Baker, John B. Miller, Howard Huntington, Eugene E. Hewlett, Isaac Millbank, Motley H. Flint, Frank A. Garbutt, Perry W. Weidner, and Martin C. Neuner.

Aero Club of Delaware, Wilmington, Del.

Aeroplane Co. of America, Boston, $100,000. A. C. Triaca, W. Mason Turner, John F. Queen.

Ovington Aero Co., Boston, $10,000. George B. Robotham, John F. Dickinson, Frank W. Carter, Henry P. Ayer.

Birmingham Aeroplane Co., Birmingham, Ala., $5,000. Jesse W. Alexander, R. B. Alexander, Hugh A. Locke and Edgar P. Pelf.

Utah Aerial Navigation & Power Co., Springville, Utah, $100,000. A. D. Flanigan, J. D. Bagley, W. B. McPherson, Milan R. Straw and Wm. Whitney.

NEW BOOKS.

THE AVIATION DIRECTORY, published by L. M. Allison, Lawrence, Kan., at 25c, is the first directory of aeronautical manufacturers yet published in America. Judging from this list there are one or two concerns not advertising in "Aeronautics." This must be looked after, surely. A second edition is now ready, still more complete. This list is invaluable to advertisers and purchasers alike. It is time now for such a work, and the author has only forestalled "Aeronautics" in this work.

LEITFADEN DER LUFTSCHIFFAHRT U. FLUG TECHNIK, von Dr. Raimund Nimfür, 8 vo., cloth, 338 illustrations, with large size plates; price 13 M. 50 Pf., from A. Hartleben's Verlag, Seilerstätte 19, Wien I., Austria.

Principal chapters: Zur Physik der atmosphärischen Luft.—Strömungsgesetze der Atmosphäre.—Tierflug, insbesondere der Vogelflug.—Das allgemeine Problem der Ortsveränderung von Körpen, über den festen Boden, durch das Wasser und die Luft.—Grundtypen von Vorrichtungen zur Fortbewegung durch die Luft.—**I. Teil. Der aerostatische Flug.** Der gewöhnliche Kugelballon. Geschichtliches.—Technik des Kugelballons. — Gleichgewichts und Bewegungsgesetze aerostatischer Flugkörper.—Der lenkbare Ballon. Geschichtliches. —Moderne Typen von Lenkballons.—Technik des Lenkballons.—**II. II. Teil. Der aerodynamische Flug.** Gleit- und Segelflieger, Geschichtliches.—Die Schraubenflieger. Geschichtliches.—Die Schwingenflieger. Geschichtliches.—Die Draevhenflieger, Gaschichtliches.—Die ersten Projekte von Drachenfliegern und die ersten Versuche mit Modellen.—Die neueren Studien mit groben Drachenfliegern.—Moderne Drachenfliegertypen.—Technik der Drachenflieger. — Kombinierte Typen. — **III. Teil. Theoretische Flugtechnik.** Zur experimentellen Aerodynamik (Luftwiderstand u. Winddruck). Der Luftwiderstand.—Der Winddruck.—Lotrechter and schräger Fall durch die Luft.—Schwebe- und Translationsarbeit. — Einige spezielle Theoreme über Drachenund Gleitflieger. — Zur Theorie der aerodynamischn Schweber und Flieger. — Luftwiderstandstheorien auf empirischer Basis.—Einige wichtige physikalische Sätze.—Allgemeine Hydrodynamik in ihrer Beziehung zur Flugtechnik und Aeronautik.—Zur Statik and Dynamik des Ballons. Praller Ballon.—Schlaffer Ballon.—Zur Theorie des Lenkballons.—**IV. Teil. Praktische und konstruktive Flugtechnik.** Der Kugelballon. — Der Lenkballon. — Die Flugmachine.—Nachtrage and Zuätze.—Namen- und Sachregister.

KONSTRUKTIONSBLATTER FUR FLUG-TECHNIKER, by Dr. Wegner von Dallwitz, paper, 183 pages, with 87 pictures, 4 scale drawings and many tables. Published by C. J. E. Volckmann Nachf. (E. Wette), Rostock i. M., Germany, at 7 marks.

Contents include: Die Theorie der Schrauben, Verschiedene Typen der Fahrzeug?Vortrieber, Das Wesen der Schrauben und der Grad ihrer Arbeitsausnutzung; Analogien zur Schraubenarbeit, zur Verdeutlichung des Verhaltens der Schrauben; Die Berechnung der Triebkraft der Schrauben, Der Motorleistungs-(Kraft) Bedorf der Schrauben, Der Dynamische Wirtungsgrad der Schrauben; Bestimmung der rotwendigen Schraubenleistung, Widerstands-Berechnungen; Die Ausführung von Schrauben flügeln, Beanspruchurg der Schraubenflügel, Die Herstellung der Schrauben, Das Ausprobieren von Luft schrauben, Käufliche Schrauben; Logarithmentafeln, Tafeln für Sinus und Kosinus, Tangens und Cotangens, etc,

THE SAN FRANCISCO MEET.

While there are fewer aviators entered than at Belmont, and the added stimulus of the Gordon Bennett race is missing, the meet from January 7 to 16th will in all probability be the greatest of 1911. Aside from the purely contest feature is the spectacular military aspect lent to the meet by the participation of U. S. troops. The Government has detailed four companies of infantry and a troop of cavalry to patrol the ground and guard the danger zone where the military and naval target practice will be carried on with real explosives. A machine gun platoon is also detailed and experiments will be made at firing on captive balloons. The troops will camp on the field during the entire period of the meet.

Bomb throwing with actual explosive shells (no oranges), released from heights where the aviator and assistant would have some measure of safety from ground fire should be productive of much valuable information.

The following aviators will appear: Latham, Brookins, Radley, Curtiss, Parmelee, Willard, Ely and probably others. Prizes and conditions have not as yet been announced.

The novice class is receiving a large entry. Novice prizes are as follows:

First event—A prize of $1,000 is to be divided into as many equal parts as there are novice aviators who fly and make a successful landing one-half mile straight-away.

Second event—A prize of $1,000 is to be divided into as many equal prizes as there are novice aviators who fly and make a successful landing around a 2½-kilometer course.

Third event—A first prize of $250; a second prize of $125, and a third prize of $75 for the best speed over a 5-kilometer standard course.

Fourth event—First, second and third prizes, respectively, of $250, $125 and $75, for altitude during the meet. To qualify, machine must go higher than 50 feet.

Fifth event—First, second and third prizes of $250, $125 and $75, respectively, for the longest time in the air made by any novice aviator during the meet.

Sixth event—First, second and third prizes, of $250, $125 and $75, respectively, for the novice machine making the best distance record during the meet.

For the purposes of the meet, a novice is defined as an aviator, and a "novice machine" as the machine of an aviator, who has never taken a cash prize or flown for a cash guarantee in any previous meet or exhibition.

Among the novices who have made successful flights are Orvar Meyerhoffer, who has a unique triplane with a 60-90 h. p. engine (detailed drawing and description of which will appear in next issue of "Aeronautics") and T. S. Kern, with a Curtiss-type biplane.

W. C. Wheeler, secretary of the Pacific Aero Club, has a well built Bleriot type monoplane entered in this class.

A. L. Smith, of Stockton, Cal., a novice flyer will have his Loose monoplane at the meet. He has been making daily flights in this little machine.

GERMAN PROTEST OVERRULED.

Under date of January 9, the Aero Club of America issued the following statement in regard to the special meeting of Federation Aeronautique Internationale at Paris, January 10th, 1911:—"The protest of the German Club against the award of the Gordon Bennet International Balloon Trophy to Mr. Alan R. Hawley was thrown out on the ground that it should have first been presented to the Aero Club of America. The protest of the Swiss Club against the organization of the same race at the start in St. Louis was not pressed.

"The protest of the Royal Aero Club of the United Kingdom against the award of the Statue of Liberty Prize to John B. Moisant was not definitely decided. The federation held that the record of the course as presented, did not show on its face that Article 29 of the Constitution of the Federation had been complied with. This article requires the consent of the Contest Committee of the Aero Club itself to any change in the conditions of a contest that may be made by the Committee in Charge, after the regulations are once published. We are advised by our representative that the question has been referred back to the Aero Club of America for further action, on the lines of this decision.

"Mr. Claude Grahame-White has cabled the Aero Club of America, protesting against his disqualification for fouling pylon No. 5 in the contest for the Statue of Liberty Prize. Mr. White claims that he was not aware until recently that he had fouled the pylon and had been disqualified."

WHITE UNSPORTSMAN-LIKE?

Mr. Claude Grahame-White seems to have queer ideas of sport where he is a losing competitor.

To a mere novice it looks this way: the Statue of Liberty race was set for a Sunday. White started off and came back. Moisant, with half the horsepower, also rounded the statue and returned in less time. Evidently, he found a more direct route.

If Moisant had more nerve than White, and took greater chances, by flying over more of Brooklyn, had White any sporting reason for wanting another try? No doubt he would win on a second try for he would then take the direct route.

No one has yet questioned the veracity of the judges in stating the time consumed by Moisant. Does Mr. White desire to put on trial the timers? Opinion is quite general that White has "no kick coming."

STEVENS TAKES UP AEROPLANE.

New York, Jan. 23.—The poor old balloon has been given the "go by" by Aeronaut Leo Stevens, or at least temporarily. To the utter distraction of Mrs. S., Leo has donned his aviation costume and is rapidly growing a pair of wings. He is stopping at Mineola these days taking flying lessons from William Hilliard in the new Burgess model D. To-day some fine flights were made "steady as a clock," as Stevens says, the machine varying to no noticeable extent from the even keel maintained by the aviator. He will stick around for a few days, he says, and keep his weather eye open. Those who have the pleasure of acquaintance will know that concealed about his person is the ever-present vaseline tube, though where such material could be used on an aeroplane is not quite apparent—oh, yes, almost forgot—the bearings of the wheels are filled with vaseline.

FAIRCHILD MONOPLANE FLIES.

Frank Schumaker has flown the W. L. Fairchild monoplane across the Mineola field since Christmas some dozen times, making a good landing each time. These are the first flights made with the big monoplane, which has been at the Mineola grounds since last spring. Few ever expected the machine to get off the ground and these flights, therefor, vindicate Mr. Fairchild and earn praise for the 6-cylinder Emerson engine.

AERO CALENDAR FOR THE U. S.

Jan. 14-18—Oklahoma City, Okla., International Aviators.

Jan. 12-13—Ft. Worth, Tex., International Aviators.

Jan. 26-Feb. 7—Havana, Cuba, Curtiss and other aviators.

Feb. 20-25—Boston, Mass., 2nd annual show.

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With its great power and never failing reliability makes it the motor "Par Excellence" for aviation.

The great fame of our "SMALLEY" Marine Motors for winning more races, each season, than any other motor, will be exceeded by the power, performance, and satisfaction given aviators by our "SMALLEY-AERO."

It is a motor that can be depended on to stay up and keep going as long as the fuel lasts.

Two cycle; 4½" bore and stroke; 2, 3, 4, or 6 cylindered.

Made completely of Aluminum. Our own exclusively devised Aluminum Cylinders with Cast Iron liners where pistons travel. (Patent applied for.)

Handsome beyond expression, resembling solid silver. Stronger than Iron or Steel alone. Very light, being Aluminum, and no factor of safety slighted. Gives more pounds pull per pound in weight than any other motor in the world.

A reliable, dependable, powerful motor made by responsible people, and fully guaranteed. Prompt deliveries, and prices right. Write us for particulars.

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Aeronautical Society

All interested in the Art of Aviation should join the Aeronautical Society. Being the first organized body of its kind, and having accomplished more than any other association, it offers real benefits to its members. What was done from the day of its formation in July, 1908, to December, 1909, is described in a booklet which will be sent upon request. It is practically a history of aviation in the U. S. during that period. In the last year 50 machines have been built in the Society's shops at Garden City, L. I. Of these, 26 have actually flown over the Society's grounds. For further information and booklet address the ***Secretary, P. O. Box No. 28, Station D, New York City,*** or else ***No. 1999 Broadway,*** where weekly meetings are held.

MANY NEW RECORDS ABROAD

New Pischoff Monoplane for Two Persons. Daimler 70 H. P. Motor. Apparatus Resembles an Automobile with Wings

PRINCIPAL ONE-MAN WORLD RECORDS.

Duration—8 hours 12 minutes; distance made, 463.6 kils. (288.06 miles); H. Farman, Etampes, Fr., Dec. 18, 1910.

Distance—584.935 kils. (363.46 miles); time, 7 hours 48 minutes 31 3-5 seconds; Maurice Tabuteau (M. Farman machine), Buc, Fr., Dec. 30, 1910.

Altitude—3,180 meters (10,430 feet); G. Legagneux (Bleriot machine), Pau, Dec. 9, 1910.

Speed—109.23 k. p. h. (67.87 m. p. h.), Belmont, Oct. 29, 1910.

Note.—The official figures in kilometers and meters are obtained whenever possible and the distances in miles are figured out to the last decimal, which frequently makes our figures vary from less accurate ones published elsewhere. Where cabled figures are used, corrections are made on the office files and the proper figures used later in any tabulations or lists of records. For instance, Leblanc's speed is usually given as 5 kils. in 2 m. 45 3-5 s., while as a matter of fact his time was 2 m. 44.78 s. for his fastest 5 kils. It is indeed difficult to get official figures quickly; even the most reliable French organ frequently has different figures in the same issue for the same flight.

BUENOS AYRES, Brazil, Dec. 16. Cattaneo (Bleriot) flew from Palermo, near Buenos Ayres across the Rio de la Plata to Rio San Juan, a distance of 58 kil. From here, after landing, he continued to Colonia, in Uruguay, another 32 kilometers, making 90 in the flight. Here he flew over the Plaza de Toros before alighting. On January 4 Paillette flew for more than an hour over the city of Buenos Ayres.

Legagneux Breaks List of World Records.

Pau, France, Dec. 21.—Georges Legagneux, in a Bleriot, established a new record in the Michelin cup competition to-day, remaining in the air 5 hours 59 minutes, covering a distance of 515.9 kilometers, or 320.56 miles.

During the flight he established the following new records:

2 hours	171 kil.
3 hours	258.5 kil.
4 hours	345.5 kil.
5 hours	432.2 kil.
300 kil.	3 hours 28 minutes
400 kil.	4 hours 38 minutes
500 kil.	5 hours 48 minutes

World Two-Man Duration and Distance Records.

Bouy, Fr., Dec. 21.—Lieut. Cammerman (H. Farman) has been awarded the $5,000 Weiller prize for cross-country flying by military aviators carrying a passenger for his flight from Bouy to Montigny-sur-Aube and return to Bouy on Dec. 21, a distance of 232 kils, in 4:3:3. Lieut. Delage and passenger flew from Etampes to Orchaise on Dec. 29, a distance of 106 kil., 3:31:00. The H. Farman machine was covered with ice and snow and the carburetor finally froze. On Nov. 26 the same officer made a flight of 204 kils. in 3:15:00.

Other Two-Man Records.

Buc, Fr., Dec. 21.—In winning the Deperdussin $5,000 prize for the fastest two-man 100-kil. flight, Laurens (R. E. P.) and passenger covered 100 kil. in 1 hour 16 minutes 50.8 seconds and made the following new records:

10 kil.	7 minutes 31.2 seconds
20 kil.	15 minutes 14.4 seconds
30 kil.	22 minutes 56.6 seconds
40 kil.	30 minutes 38.6 seconds
50 kil.	38 minutes 19.4 seconds
100 kil.	1 hour 16 minutes 50.8 seconds

362.343

Woman Wins Endurance Prize.

Dec. 28.—Mlle. Helene Dutrieu (H. Farman) won the Coupe Femina offered for the longest flight made by a woman before sunset, Dec. 31. She flew 167.2 kil. (103.8 miles) in 2 hours 35 minutes. The previous record was held by Mlle. Marvingt (Antoinette), who flew 53 minutes. Mlle. Dutrieu bettered this by doing 60 kil. in 1 hour 9 minutes. Mlle. Herveu (Bleriot) flew for 1 hour 15 minutes and 2 hours 2 minutes

New World Endurance and Distance Records in Flights for Michelin Prizes.

Buc, France, Dec. 30.—Maurice Tabuteau, contesting for the Michelin Cup in a Maurice Farman biplane with a Renault engine, broke the world's aviation record for distance, covering 584.105 kil. (362.88 miles) in a continuous flight of 7 hours 48 minutes 31 seconds.

Tabuteau had before made the best mark in this year's competition for the Michelin Cup, having on October 28 made a flight of 289.36 miles. The cup is awarded annually, along with a cash premium of $4,000, to the aviator making the longest sustained flight within the twelve months.

The trophy and prize was won for 1908 by Wilbur Wright in France on Dec. 31, flying 124.7 kil. (77.48 miles); time, 2 hours 20 minutes 31 seconds. World distance and duration record.

On November 3, 1909, H. Farman won it, making new world distance and duration record by flying 234.2 kil. (145.52 miles); time, 4 hours 17 minutes 32 seconds.

Farman now holds the world duration record and Tabuteau the world distance record. Farman made his world duration record December 18, flying 8 hours 12 minutes, covering but 463.6 kil., as compared with Tabuteau's 465.7, on October 28, when he flew for 6 hours 1 minute 35 seconds.

On the 29th Tabuteau started out to beat Legagneux's record, but came down on account of mist after covering 400 kils. His time for 390 kil. was 5 hours 12 minutes 49 1-5 seconds. At Etampes, H. Farman was also flying, but came down on account of the rain freezing on his planes, after covering 150 kil.

While Tabuteau was flying, on the 30th, Renaux started but at last came down after making 350 kil. in 4 hours 56 minutes 43 seconds.

Thomas (Antoinette) was another competitor at Mourmelon. One of his wings touched in making a turn, thus officially terminating the flight, after being up 3 hours 5 minutes 4 seconds, covering 262 kils.

OTHER NEW RECORDS.

Tabuteau established a new record for 7 hours of 522.935 kil.

On Dec. 31, five aviators were flying for the Michelin prize. At Etampes Henry Farman flew for 7 hours 11 minutes, covering 487 kil. At Buc, Pierre Marie (R. E. P.) flew for 6 hours 29 minutes 19 1-5 seconds, covering 530 kil. and establishing the following new records:

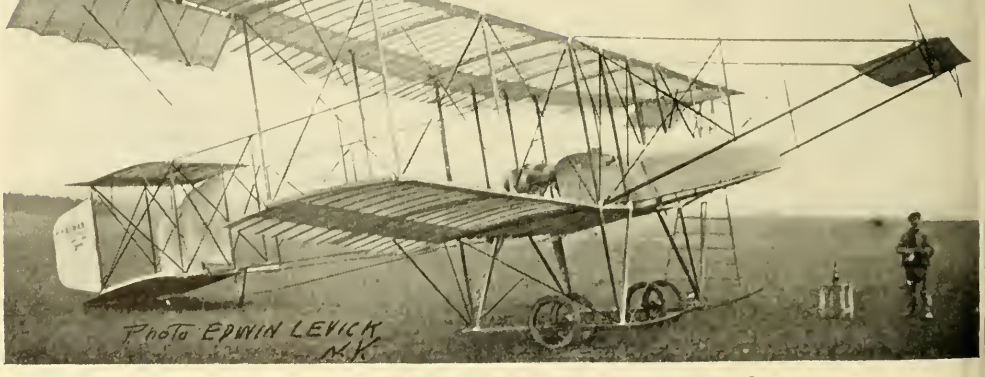
250 kil.....3 hours 4 minutes 28 seconds
300 kil.....3 hours 40 minutes 55 2-5 seconds
350 kil.....4 hours 17 minutes 26 1-5 seconds
400 kil.....4 hours 54 minutes 6 4-5 seconds
450 kil.....5 hours 30 minutes 35 3-5 seconds
500 kil.....6 hours 7 minutes 7 4-5 seconds

At Douai, Louis Breguet (Breguet) covered 390.42 kil. in 5 hours 2 minutes 41 seconds. Sommer (Sommer) had to land after 2 hours 40 minutes. At Pau, Legagneux (Bleriot) quit after 2 hours 20 minutes, flying nearly 300 kil. At Mulhouse, Germany, Amerigo (Aviatik) started out for the prize and flew 3 hours 7 minutes.

A. C. F. $20,000 Goes to Wynmalen.

Paris, Dec. 31.—No other aviator with passenger having completed the course from Paris to Brussels and return for the Auto Club's $20,000 prize, the same was awarded to Henry Wynmalen, Dutch aviator, who, accompanied by Louis Dufour, accomplished the wonderful flight on October 16-17. Two intermediate stops were made going and four on the return. Total duration of the flight, 28:36:43, while the actual flying time was 13:12:28. The machine used was an H. Farman.

Legagneux and Martinet made the trip one way on November 13, with one stop, and got partially on the way back when the H. Farman was damaged. Mahieu (H. Farman) and passenger made the trip to Brussels, but the return was abandoned. Several other aviators tried, some of them twice, unsuccessfully. Legagneux twice reached Brussels; the second time he was detained over the time limit by weather. On December 29 a Belgian aviator, Lanser (H. Farman), got almost there but was held by fog at the second stop. The time limit having been reached after delay on account of weather, he had to withdraw, but continued to Brussels on the 31st.



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¶ Fox Aero Motors are the simplest, most reliable and most powerful Aeronautic Motors yet produced. They are two-cycle water cooled, and are guaranteed against overheating under all conditions. They are equipped with the Fox Fourth Port Accelerator, the greatest improvement ever made for increasing the speed, power and flexibility of two-cycle motors.

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¶ Fox Aero Motors are made in six sizes, 24 to 150 H. P., four, six and eight cylinders. Full details and prices on application. Deliveries guaranteed.

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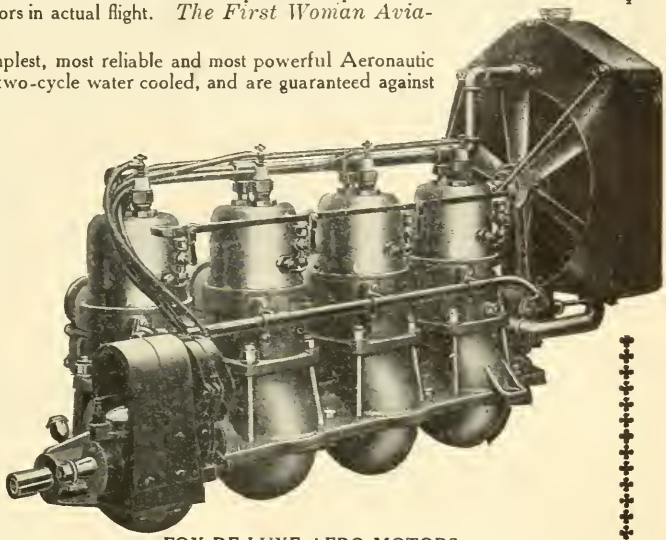

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"Camasco" Knock Down Planes from $150.00 up.
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Sopwith Wins $20,000 Prize.

London, Dec. 31.—Thomas Sopwith (Howard Wright) has been awarded the Baron de Forest $20,000 prize for the longest flight across the Channel by an Englishman in an all-British machine. His flight was made, as before recorded, on December 18, from Eastchurch across the Channel to Beaumont, in Belgium, a distance of 169 miles, in 3 hours 40 minutes.

Cody Wins British Michelin.

Dec. 31.—Capt. S. F. Cody won the British Michelin $2,500 prize for British built machines by flying, December 31, 1910, over Laffan's Plain, 185.46 miles, in 4 hours 47 minutes, using his big biplane, which has flown, it has been figured, 1,230 miles in the two and one-half months up to the end of December.

Previous to this Thomas Sopwith made several tries. On the same day he flew at Brooklands, for 4:7:17, covering just over 150 miles. Alec Ogilvie flew his English-built new type Wright on the 28th 140 miles in 3:55:00 in competition for the same prize. This was, of course, fitted with a British engine.

1911 International Race.

Paris, Jan. 10.—The F. A. I. set the distance for the international race, to be held in England this year, at 150 kil. (93.20 miles) over a course of not less than 5 kil. In 1910 it was 100 kil. (62.137 miles).

Bosch Magnetos were used by Tabutean, Legagneux, Farman, Cody and Sopwith in their record flights.

HOW ALTITUDE RECORDS ARE MADE

THE same instrument which has served balloonists for testifying to altitudes reached now does duty for the aviator in the same capacity. A short description of the operation of one of these instruments, called a recording barometer, or "barograph," is given following:

This instrument, illustrated herewith, has graduations marked in meters or feet of elevation. At the sea level an ordinary barometer would show 760 mm. or 30 inches of mercury, whereas in the altitude barometer this graduation would be marked O.

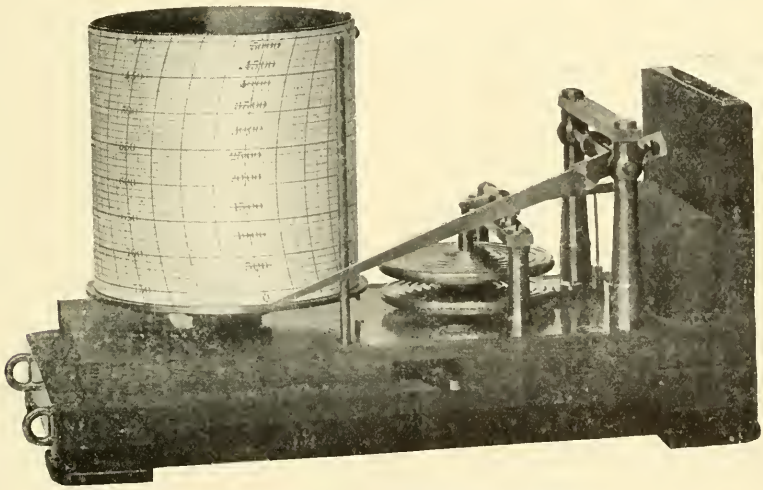
As the aeroplane ascends, the atmospheric pressure decreases and the pen of the instrument, instead of recording inches of mercury, records the height in meters, or feet, as above stated.

The instrument consists of a wooden or aluminum case, with one glass side, and contains a cylinder making one revolution in a given time, usually 6 hours. The differences in barometric pressure or height are communicated to a series of vacuum chambers shown in the cut. As these chambers rise or fall, this movement is transmitted to a series of appropriate levers which communicate their displacements to a pen-arm at the end of which is the recording pen. In starting from a given point, it is necessary that the instrument be adjusted for the height of that place above the sea level. This is done with a key through an opening in the bottom of the case.

In making an official record the instrument is hung from some part of the aeroplane and stayed with a couple of cords or tapes to keep it from swinging. The official observer attends to the adjusting and the instalment in the machine. After the flight he takes the instrument to the judges who determine the actual height made by taking out the strip of paper on which a graphic representation of the flight has been made.

The aviator himself may, perhaps, carry a pocket barometer of his own which shows him approximately what height he has reached, as usually he cannot see the other instrument. This apparatus is inclosed in a case about the size of a watch. The dial is in two parts, one within the other. The one is set to zero at whatever height the start is made from. A long hand then moves around as greater height is attained and points directly to the altitude figure on the circular scale which takes the place of the hours and minutes on a watch face. This pocket affair does not make any graphic record and the aviator has to consult it as he would a watch.

A considerable industry has been built up in these instruments for balloonists and aviators. Jules Richard is probably the foremost and best known and it is his barograph which we have described above.



The Mechanism of a Richard Barograph.

EXCHANGE AND SUBSCRIBERS' FORUM

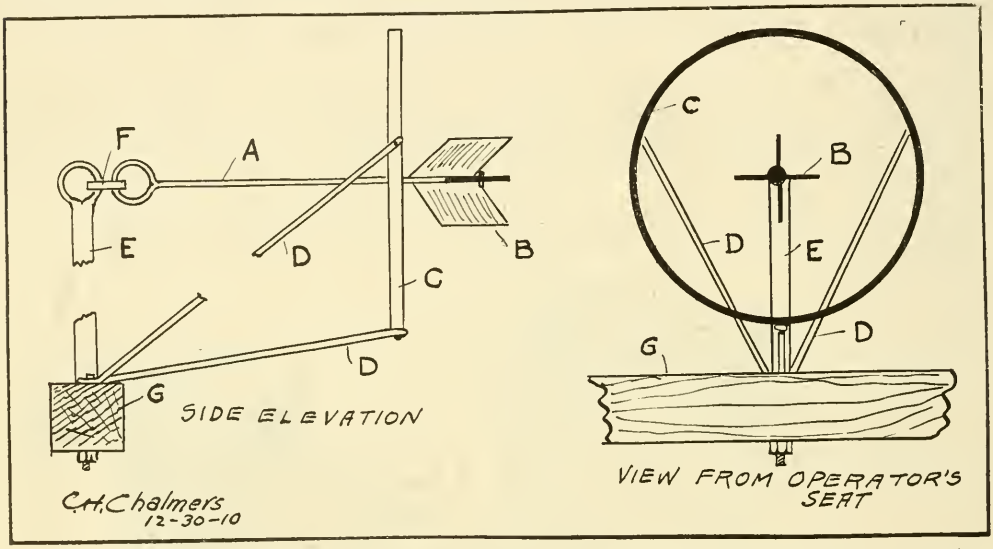
Level for Aeroplanes.

To the Editor:

An idea occurs to me for an inexpensive device to attach to an aeroplane to take the place of the "rag indicator" described in Jan. "Aeronautics"; something a trifle more genteel and also offering a little something in the way of a quantitative reading.

My device, like the Wright indicator, is intended to be located in front of the aviator.

In place of the rag I use the arrow A, with four vanes B, supported by the stud E. The arrow is attached to the stud E by the universal joint F. The arrow in normal flight stands straight out behind the point F, and in the center of the index ring C. The ring C is supported as shown by the three supports D. The whole thing is fastened to the wooden strut G.



Both the ring and the end of the arrow are painted black. The arrow of course does all the rag does, except it won't flutter so much, and the ring serves as an index to show how far the arrow is away from normal. The rag indicator undoubtedly is the best thing extant for the purpose, but this refinement thereof is offered as a possible betterment. Not patented.

Respectfully yours,

Minneapolis, Minn. C. H. CHALMERS.

Who Will Try a Wireless Set?

A very light wireless receiving outfit has been built by a young man, Samuel Wein, who is anxious to have his system tried on an aeroplane in flight. There is no necessity for ground or other wires hanging from the aeroplane. Mr. Wein will attend to the installation of the outfit. Anyone desirous of trying the experiment may address him, care of the Brooklyn Wireless & Electrical Novelty Co., 766 Broadway, Brooklyn, N. Y.

Criticism of Howell Theory.

To the Editor:

In an article in the January issue of "Aeronautics" Mr. Wesley Howell claims that the force necessary to drive an aeroplane is derived from condensation and reaction of the condensed air driven backward by the propeller. As I differ with him and am very much interested in aeronautics, seeking for more light, kindly permit me, as a student, to explain my position,—why I differ with Mr. Howell.

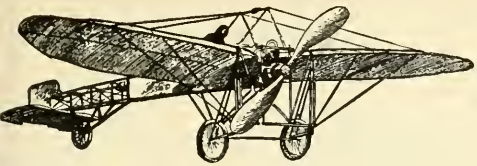
First, I reason that there is, with every revolution of the propeller a slice of air driven backward, which of itself would give the aeroplane a forward impetus, but this is all the force that I can account for that is derived from the condensed air. Reaction from the slightly condensed air impinging on inert air seems to me negligible, and in fact, I sincerely doubt if we get any help at all from reaction supposed to be produced by mechanical compression in open space. Such reaction should be rather in evidence when the exhaust on an automobile engine is turned rearward or when so powerful an engine as the locomotive ejects its steam through the funnel into space and inert air. The commotion is all at the other end, in the fire box. The work of the propeller is similar, as it acts upon air within its radius, fanning it backward and thereby causing a terrible commotion in front, from whence the air rushes with the speed of the propeller toward it, to get in touch with the most rarified stratum of air, which is found in touch with the front edge of the propeller. Thus it is that the densest part of air is at the back and the most rarified at the front of the propeller.

The real work of the propeller, as I reason it out, is to divide the air into portions of unequal density and to create a third very rarified portion immediately in front into which the propeller itself is continually drawn. It is obvious then, that here there is another source of power that moves the aeroplane—a pull rather than a thrust. The thrust derived from the condensation depends upon the speed of the propeller, but after the first revolution, all succeeding slices of air only replace one another and then vanish in space and reestablish equilibrium. On account of disturbance in equilibrium, we are cognizant of those tremendous evidences of power, such as we see in storm and cyclone, and we always find a rarefied stratum of partial vacuum, the forerunner of a storm. A mechanically produced storm is identical with that which the storm nature produces, in that there is a rarefied stratum of air and a denser stratum rushing to come in touch with it, or in other words, a want of equilibrium.

I am of the opinion that we should study thoroughly how to produce and maintain rarefaction in the construction of aeroplanes.

H. THADEN.

38 West Alabama street, Atlanta, Ga.



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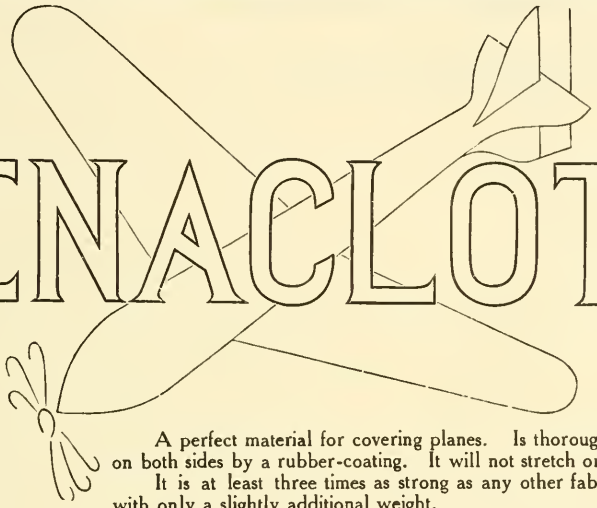

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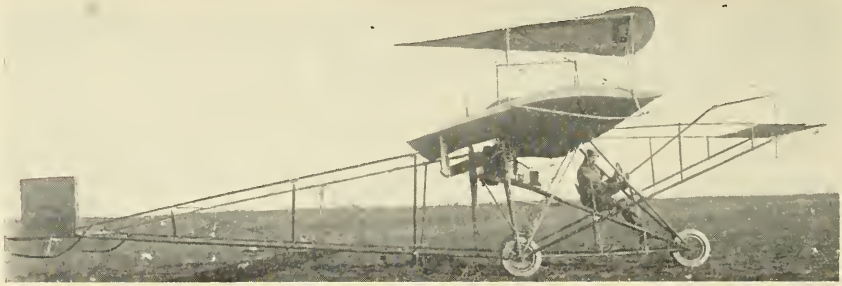

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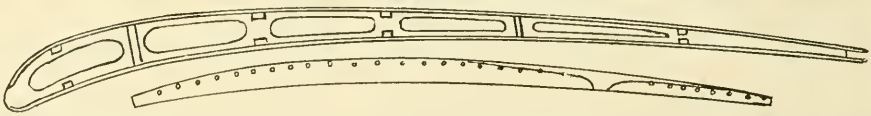

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Hoxsey and Johnstone Accidents.

Gerard Hotel, New York,
January 5, 1911.

To the Editor:

The recent sad fatalities to my friends, Mr. Arch. Hoxsey and Mr. Ralph Johnstone, prompt me to address you in view of giving my opinion as to the cause, especially in view of the fact no theory has been advanced upon which deductions could be made or propounded among those skilled in the science of aerodynamics that could be attributed to the direct cause of the recent disasters referred to, including that which befell Mr. Moisant and some others before him.

An aeroplane in flight with its nose dipped towards the earth at a degree wherewith it no longer retains an angle of incidence towards the line of descent, and wherein the center of pressure is entirely gone from under the main plane eventually, by gravity, develops such terrific speed that it becomes impossible to again right the machine; the small area of surface on the horizontal control becomes inadequate to counteract the tremendous pressure now exerting its full force upon greater area of exposed surface, namely, that running along the main plane on top, near its leading edge.

I am of the opinion the extremely daring aviator desiring to execute a sensational rapid glide towards the earth while in flight, or while performing a spiral dip, likewise the aviator who makes too quick a landing, unconsciously allows the center of pressure under the plane to remain at zero for far too long a period, for after executing either of the above mentioned performances gravity has already begun to play an all-important part, causing him to travel towards the earth with an ever-increasing speed of lightning-like rapidity; he has already dipped the nose of his machine towards the earth, the aeroplane no longer retaining an angle of incidence towards the line of descent, the tremendous power of head-on pressure caused from the terrific speed the force of gravity have brought about, is now directed against, and on top of the forward end of the main plane. This volume of air pressure becomes almost as a solid, offering a resistance, likened to a stone wall exerting its tremendous force against and on top of the parabola of the curved surfaces of the plane situated immediately back of the leading edge. The pilot eventually pulls at his levers in an endeavor to bring the machine to an even keel towards a horizontal line of flight only to find the area of surface on the horizontal control is now insufficient to counteract the head-on pressure directed against the top from edge of the main plane. The latter offers an area of surface to this head-on pressure many times in excess of that possessed by the horizontal control, and so the aviator is entrapped to his doom.

As it is not considered practical by many, to increase the surface of the horizontal control, then may I suggest the advisability of encouraging inventors to produce a safety stop, to be put in use on the control levers of aeroplanes that will prevent flying up or down beyond a certain safe angle.

Hoping my conclusions will be of some benefit to aviation, sincerely yours,

JOSEPH W. CURZON.

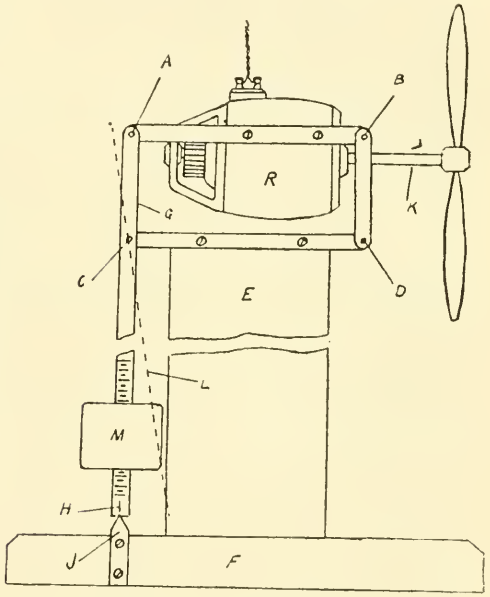
(A flyer with experience gained with a standard-made aeroplane, but who up to now has been compelled to be content with making straight away flights over a course free from obstructions on account of an obstacle, namely, second-hand heavy auto engine, which has been the source of more study to him than flying at meets.)

SKYSCRAPINGS.

Instead of erecting a small 2 x 4 monument for each aviator in the city in which he was killed, would it not be better to erect one large one in New York or Washington on the style of the Soldiers' Monument, with the names of the different aviators that have been killed inscribed thereon?—A. Leo. Stevens.

Propeller Testing Device.

For ascertaining the thrust of small screws an arrangement might be made, to consist of an electric motor R, mounted on a framework consisting of four straight pieces of metal on each side of the motor. The metal pieces are pivoted at A, B, C and D, the bottom piece being fixed to the wooden support, E, secured to the base F, in such a manner that the motor can swing from right to left, and vice versa, but the frame is normally kept in position by one of the side pieces G, being extended downwards, and provided with a counterweight which can be slid up or down. When at rest the centre mark H, at the bottom extremity of G, coincides with the pointer, J. Different propellers which it is desired to test can be mounted on the motor shaft K. When the propeller is fixed in position and the motor started, the thrust will cause G to swing into a position out of the vertical, as indicated by the dotted line, L. When the motor has reached the correct speed, the weight M, is slipped down until H again coincides with the pointer J. The part of G, below the pivot C, is marked with divisions so that the exact position of the weight, M, necessary to bring G back to the vertical under the influence of the thrust can be noted.



If an ammeter is fixed in the motor-circuit, it will indicate the proportionate power required by different propellers to produce the thrust indicated by the position of the weight M, at any given speed. An electric motor takes current exactly in proportion to the power absorbed (the current required to run the motor light should be deducted from each reading). The divisions on G can be arranged to indicate the thrust in pounds or other suitable unit.

By noting the speed, current, and position of M, and tabulating these results, a good deal of information as to the merits of different propellers could be obtained.

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ELIMINATION RACE FOR AMERICAN TEAM.

In line with the arguments of "Aeronautics," the Aero Club of America has announced the holding of an elimination race for the selection of the American team to go to England to bring back the international trophy. Robert J. Collier has offered a cup for the winner in this elimination race.

CREDIT FOR BLERIOT DRAWING.

In the drawing of the Bleriot XI, published in the January number, we neglected to give credit for the design to Mr. R. H. Beaumont, Philadelphia, through whose kindness we were enabled to publish this drawing.

"AERONAUTICS'" NEW ENGLAND AGENT.

"Aeronautics" has secured Mr. Gil Rankin of Boston for New England agent, and it is expected that the campaign of publicity which is now being started in that territory will shortly show results in an increased number of advertisers and subscribers to "Aeronautics" from that section.

Mr. Rankin has been connected with the office of Chester I. Campbell, the Boston show manager, and has a large acquaintance in the automobile, motor boat, and aerial lines of trade. He assisted Mr. Campbell in 1910 with the first national exhibition of aerial craft in Boston, and has been keenly interested in aeronautics and aviation for several years. Mr. Rankin is now negotiating with the Longfellow Monoplane Co. of Allston, Mass., for lessons in aviation, and he will probably be that company's first student. His success as an aviator is considered assured by his Boston friends, and he will use such knowledge for further advertising "Aeronautics"—both the magazine and the science. Address communications and submit New England advertisements to Gil Rankin, N. E. Agent, "Aeronautics," 5 Park Square, Boston. See him at the Boston Aero Show at Mechanics building, February 20-25.

INSPECTION OF AEROPLANES.

The idea of an official inspection of all machines entered at meets seems to have been met with derision by the men best qualified to speak, the men who fly the machines to be inspected.

Certainly no one could or would be more careful of his machine than the operator himself. Every aviator of consequence goes over every part of his machine before making a flight, or has his mechanics do so. How would it be possible for an official of any club or meet to closely inspect every machine every time a flight was attempted? Inspection at the beginning of a meet would mean nothing, for a wire or fastening might give way at any time, and be fixed by the mechanics without the supervision of an inspector. Even admitting official inspection would amount to anything, where can any one man capable of the job be found available to-day? No deaths, so far as known, have been the result of any defect which could have been located beforehand by an army of inspectors. James Radley says: "When we finish going over the machine we do not need an inspector, who knows much less about it than we do, to tell us what to do. The idea is impracticable."

According to the Press Agent of the U. S. Aeronautical Reserves, of 53 Fifth Avenue, New York, its official organ is "peculiar in its field; its sole purpose is to create interest in aviation. . . . It is perhaps the only magazine of its kind in existence to-day, published solely in the interests of the science; there is not a salary of any kind paid to any member of its staff."

Sample copies of "Aeronautics," "Aircraft," "Aero," and "Fly," are being sent to the P. A. for his perusal. There are about two dozen other aeronautical journals, periodicals published in various countries. As the U. S. A. R. official organ industriously solicits advertising from manufacturing firms in the aeronautic field, its claim of uniqueness is not valid—save for its non-salaried P. A.

Notes on the Aeroplane Propeller.

In the valuable article by Mr. Matthew B. Sellers on pages 1 and 2 of the January number there occurred a misprint, owing to the fact that corrected proof did not arrive until after the issue was on the press.

Kindly correct the equation in the third line of the right-hand column on page 2 to read as follows:—

$$N_1 = \frac{N_s}{\sqrt{2\,S - S^2}}$$

HILLIARD FLYING.

(Continued from p. 59)

with farmhouses, stone walls and trees plentifully dispersed.

It will be noticed that the machine is an improvement over the Farman, in view of the extensions of the skids forward and upward to support the front elevator. These skids will rise over any obstructions in landing and save the machine from injury. On one occasion the machine even smashed a wooden fence without hurting the aeroplane.

Of the seven aeroplanes ordered by White, of England, from the Burgess Company & Curtis, of Marblehead, Mass., one has already been shipped, a model E. Of two more well under way is a large two-passenger machine similar to the Burgess model D. White has asked the company to design a new type of biplane along entirely novel lines, but no details are available.

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A. J. Cronkhite, of 1403 Ellis boulevard, Cedar Rapids, Ia., is building his third monoplane, for two persons. No turnbuckles are being used, all wire being tightened by one lever. Stability is by warping. Joints are trapped and bolted together, without any holes in the beams. Perpendicular truss rods are held to lateral beams by friction.

Robert J. Collier received delivery of his Wright biplane on January 17, at Belmont Park, where it will be stored. J. C. Turpin, of the Wright company, is setting up the machine.

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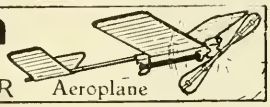

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IN THE AERIAL MARKET PLACE

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Hefty Mfg. Co., New Concern.

John C. Burkhardt, of Portland, Ore., has formed the Hefty Manufacturing Co., to market aeroplanes, engines and propellers. Mr. Burkhardt is very favorably known to those interested in aeronautics. His first machine was of novel construction and flew successfully. After later experience and study he has gotten up a machine of good construction and simple, to sell at a moderate price. Purchasers can depend on efficient workmanship.

Latest Rinek News.

With the view of being in a position to successfully cope with their increasing business, and to be able to meet in a measure the anticipated enormous demand for aviation engines of proven merit during the coming year, the Rinek Aero Manufacturing Co. have, within the past few months, wisely augmented their manufacturing end by the addition of many new machines, the most prominent of which is a new external grinder for use in connection with the grinding of pistons, and an internal grinder for the finishing of cylinders.

Although the Rinek company have been making prompt two-week deliveries on their large size engine, the 60-horsepower, 8-cylinder, they are still further desirous of increasing their facilities to such extent that they will be in a position to make prompt deliveries, even during the rush season, on both size engines.

The policy of this company in selling their engines on a rating of thrust power cannot be too highly commended, inasmuch as the purchaser under these conditions knows exactly what he is getting in the way of actual propulsive force. Horsepower rating is all very well in the motor boat or automobile field, but is becoming entirely too vague in connection with the rating of aviation engines, inasmuch as when taken alone, the purchaser is still in the dark in regard to his real flying power. Probably in nine cases out of ten, a propeller of the most efficient design for his plane, when fitted to the engine, will pull its speed down to such a point that the horsepower developed is hardly worth considering.

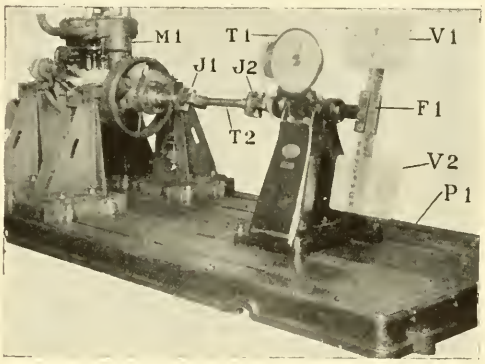
Under the circumstances, there can be no come-back at the manufacturer, as the engine is supposed to develop so much horsepower at some certain speed. The purchaser, who, after having bought his engine, has in a measure to yet procure the other half of his power plant, i. e., the propeller, and not until he has actually fitted the propeller to his engine and made a test of same, does he know what he is getting in the way of real push or force.

Another six months will probably see a number of the other engine manufacturers falling in line with regards to this idea, as a large majority of aviators and experimenters are beginning to realize that horsepower alone will not drive their machines into the air. Experience has taught them that it is the amount of thrust of propulsive force, irrespective of horsepower developed, that does the trick.

The Rinek company claim greater thrust per horsepower for their engines than any other makes, foreign or American, on the market at the present time, and their claim is more than substantiated by the results which their engines have produced.

Tracy Exhibits New Dynamometer.

Joseph Tracy's dynamometer was exhibited at the recent A. L. A. M. auto show, where it attracted marked attention on the part of automobile engineers because of its rugged simplicity, and the wide range of service of which it is capable. Referring to the illustration, the motor M1 undergoing test rests upon adjustable pedestals and the crankshaft of the motor is connected to the dynamometer through the tumble-shaft T2 requiring the use of universal joints J1 and J2, leading to an outboard bearing which carries the fanshaft and the arm F1 to which is adjustably attached the veins V1 and V2. The tachometer T1 is belted to a pulley on the fanshaft, and this instrument, instead of being graduated in revolutions per minute, is calibrated to read in horsepower, there being one scale on the dial of the tachometer for each of the positions to which the veins V1 and V2 may be adjusted on the arm F1. Adjusting the veins outward in the radial plane increases



the power required to propel the fan at any given speed, and it has been found in practice that this form of dynamometer offers a wide range of testing opportunities, so that the various types and sizes of motors may be quickly tested, and one of the points which should not be overlooked in the discussion of this dynamometer lies in the utility of the same for continuous loading of the motor, undergoing test. In discussing the details of the dynamometer with Mr. Tracy, he pointed out that the tachometer is calibrated at each of the allowable speeds, under the several loading conditions by means of an electrical equipment, and that the result obtained in this way reduces the possible error to that of the tachometer which is guaranteed to work with an error limit which is considerably less than 1 per cent. The equipment rests upon a heavy cast-iron platen so that an unbalanced motor running at a high speed is held down, and the operator is enabled to do his work under favorable conditions.

Gibson Propellers.

Hugo C. Gibson was the pioneer in commercializing the propeller for aeronautic purposes in the United States, having built up the business in propellers carried on by the Requa-Gibson Co. Mr. Gibson has transferred his affections to the factory where his famous propellers were made—the works of E. W. Bonson, 806 11th avenue, New York City, where in the capacity of consulting engineer, he may be found, ready to help solve the intricate problems of the air vessels, engines and propellers. Mr. Bonson is supplying these propellers direct where formerly he manufactured them for the Requa-Gibson Co.

The 1911 Elbridge Engine.

Some one officer, at least, of the Elbridge Engine Co., if not all of them, have attended every aviation meet or convention of any importance held in America; they have personally inspected and attended the trial flights of almost every amateur machine built; have had two machines of their own devoted to experimental work; and have devoted both time and money to the problems of propeller efficiency, methods of installation, lubrication, fuel, economy, radiation, and all of the incidentals of flight.

The results of this observation, study and experiment are embodied in the 4-cylinder model of the 1911 "Aero Special" shown at the Grand Central Palace Aero Show during the first week in January. It is a more handsome piece of machinery, for the engine shines from the bottom of the aluminum crank-case to the top of the polished brass water-jackets.

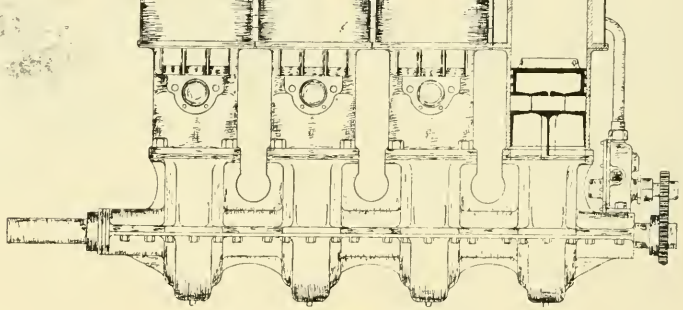
To begin with the question of power for weight, the four cylinder 1911 "Aero Special" weighs without magneto less than 150 lbs., and it developed and maintained on a recent demonstration, the company states, more than 57.8 net brake horse power at 1500 r. p. m. At as low a speed as 600 r. p. m. the engine gave better than 28 b. h. p. and 40 b. h. p. at about 1050 r p. m. The engine will be rated at 40-60 h. p. and guaranteed to maintain more than 40 h. p. for an all-day run. In order to prove that the engine will run as long as may be required, a recent ten-hour test is reported by the Elbridge Company. The engine was started at 10.10 a. m. with dynamometer fan absorbing 43 b. h. p. at 1100 and ran with throttle wide open, spark fully advanced, until 8.10 p. m. It was stopped at that time because of the objection of the neighbors to the roar of the exhaust. During all of the ten hours not an adjustment of any kind was made to any part of the engine, and it was running as strong and smooth after ten hours as when it was started in the morning. The engine was one taken at random from stock, with usual fittings.

The materials and finish of the new engines are of the finest throughout. Cylinders are of a special combination of steel and fine grey iron, bored, reamed and ground to perfect size. Each set of pistons is finished to exactly fit its corresponding set of cylinders. The cranks are turned from hammered forged billets and finished by grinding every part, to secure accurate balance. Connecting rods are of special steel, die-forged, with a large margin of strength beyond normal requirements.

Connecting-rod bearings are bronze, boxes deeply lined with Babbitt metal, the bronze affording insurance against the pounding out of the Babbitt, without risking the cutting of the shaft. Adjustments to the connecting-rod bearings, should any be required, are easily made by removing crank-case bolts, which permits the removal of the lower half of the case.

Several of the external details are new since last year. Ignition is by high-tension magneto, the plate for which is cast integral with the crank-case. There are ball-thrust bearings on both ends of the crank-case so the engines may be used in monoplanes or biplanes without any alteration. New automatic carburetors which are adjusted for good and all before leaving the factory will prove acceptable to those who have had trouble making delicate adjustments. The new intake manifolds with their easy curves permit faster gas travel than last year's model, and the water intake and overflow manifolds, if not more efficient, add to the highly finished appearance. Lubrication is by the simple system of adding a pint of good gas-engine oil to each five gallons of gasoline.

Bore and stroke remain the same as last year, 4⅝ by 4½ inches. The Elbridge Engine Co. has patterns for a larger cylinder, one with five-inch bore and five and a half inch stroke, but believes there is no type of aeroplane on the market to-day which can use either safely or advantageously more power than is provided by the six-cylinder "Aero Special" rated at 60-90 h. p.



1911 Elbridge "Aero Special."

"Amateur Aviation in America" gives a sketchy record of most of the flights made by novices in America during 1910. It was compiled and is distributed gratis by the Elbridge Engine Company.

In the new catalog which is now on the press not only the regular line of "Featherweight" and "Aero Special" engines is listed, but as well there are three smaller engines, of two, three and four cylinders respectively, with bore and stroke of 3¾ by 3½ inches, designed for light machines, where from ten to twenty-five horse power is required. The first of the new "Baby Featherweights" is being built for M. B. Sellers' 10 h. p. multiplane. Copies of the catalog will be sent on request addressed to the Elbridge Engine Company, at 10 Culver Road, Rochester, N. Y.

The Elbridge Engine Company was much pleased with the receipt of the following telegram from the Mathewson Automobile Company, of Denver, Colo., which company bought the first 1910 "Featherweight" 4-cylinder engine, and by chance also received the first 1911 model Elbridge "Aero Special."

The telegram, dated January 4, says: "Elbridge Engine Company, Rochester, N. Y. Mathewson biplane equipped with Elbridge motor, George Thomson, aviator, flew four

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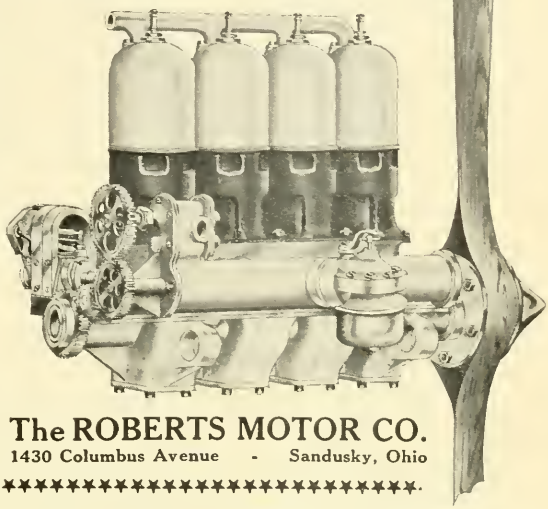

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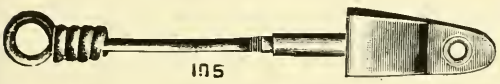

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Fox House Organ.

"Fox Facts" is the name of the house publication of the Dean Manufacturing Co., of Newport, Ky., makers of Fox aero and marine motors. In this edition space has been given to aero motors and news items. This publication will be sent free to all inquirers.

Goodyear Rubber Fabrics.

Aeroplane manufacturers all over the country have been examining the new Goodyear "Wing" rubber-coated aeroplane fabrics and many have placed large orders. The Wright brothers' chemists have reported so favorably on the new fabric that it is expected it will be used on Wright machines in the future.

It is reported that orders also have been received from the Burgess Co. and Curtis, the Metz Co., the Lovelace-Thompson Co. and several other manufacturers. Among the leading aviators who have ordered rubber-coated fabric are Charles K. Hamilton and all members of Moisant's Crew of International Aviators.

The Goodyear Tire & Rubber Co. is the first in America to produce a full line of rubber-coated fabrics, tires and rubber springs.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has been working on the substitution of rubber-coated fabric for silk and canvas for planes for over a year, and the product they are now putting on the market is called perfect by aeroplane manufacturers.

Goodyear rubber-coated fabric has been found to be absolutely moisture proof. It gives less resistance to the air and the speed of the machine is actually increased as much as 10 per cent. This fabric is far stronger than silk and will not stretch or shrink.

Three "Gray Eagle" biplanes have been sold by R. O. Rubel, Jr., & Co., of Louisville, since Christmas.

A. Hendrian, of Decatur, Ill., is the purchaser of a Detroit Aeroplane Co. motor for his "Demoiselle."

The "Gray Eagle" machines are the standard type.

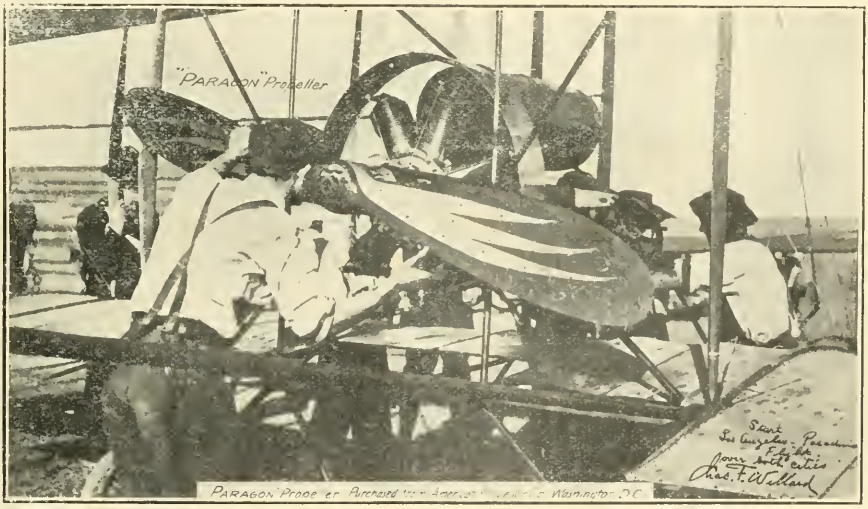
Ladis Lewkowicz, who financed the bringing of the first Bleriot to this country last spring and which never flew, after a summer of flying in France, Holland, Hungary, etc., is coming back soon to give exhibitions with a fast Bleriot and also start a factory to build aeroplanes.

E. D. Moore, formerly night manager of the Associated Press, in New York, has attached himself to the Curtiss Exhibition Co., as publicity man on the Pacific Coast.

ASCENSIONS

St. Louis, Jan. 8.—J. C. Hulbert, of the Aeromotion Co., and Paul McCullough left in the "St. Louis IV" with the fond hope of descending somewhere near the Atlantic coast. Boreas, not consulted, resented the independence of the balloonists, and drove them south, to a town in Mississippi bearing the euphonious name of Scooba, so it is plainly seen the scoop did not pan out. Facetious Kentuckians shot at the high ball, and one of the bullets could even be heard by the aeronauts whizzing past them. What an awful commentary on the marksmanship of the Blue Grass State! No doubt the marksmen were young and inexperienced at balloon-hunting or they would have done better.

Landing would not have been made at Scooba but for the fact that the intrepid voyagers had not made proper arrangements with the press for an ocean trip starting from the Gulf. They landed the following day, after being in the air 22 hrs. 40 min., which is going some for novices at ballooning, for neither man is a licensed pilot; though this only proves that the Aero Club of America has unintentionally passed by two first rate balloonists without honoring them with certificates of capability. The distance in an airline is approximately 420 miles.



Willard's Gnome-Engined Curtiss.

San Antonio, Tex., Jan. 2.—H. E. Honeywell, Dr. G. N. Fairfield, Dr. W. A. Herring and Dr. Edward Ayer. No details. Balloon "Centennial"

San Antonio, Tex., Jan 8.—H. E. Honeywell took up Miss Minnie Cleary in his balloon, which ascended to the height of a mile, landing some seven miles away (7 passengers) "Centennial"

St. Louis, Jan. 6.—S. L. Von Phul took up Marion Lambert, landing at Greenville, Ill., a distance of 45 miles; duration, 2 hrs.

77 San Antonio, Jan 16.- H.E. Honeywell + 5 passengers

San Antonio, Jan. 23.- H.E. Honeywell + 6 passengers

RYAN WANTS A. C. A. MADE NATIONAL

IN January 6, at the invitation of the Aero Club of America, many members of the Aeronautical Society, American Society Civil Engineers, American Society of Mechanical Engineers, American Society of Electrical Engineers and the New York Electrical Society, assembled in the auditorium of the Engineering Society Building, 29 West Thirty-ninth street, New York, to listen to various addresses and to see for the first time moving pictures of the Belmont meet.

The auditorium was fairly well filled and many ladies were present.

Robert J. Collier, head of the National Council, read some poetry in memory of the victims of aviation from the death of Delagrange. In a short speech he told what he wanted to do in the National Council, that he desired to make it a democratic body in policy. He had bought an aeroplane and was going to know more about the practical side of it.

Resolutions of regret and sympathy were passed and ordered transmitted to the families of Messrs. Chanute, Johnstone, Faure, Hoxsey and Moisant.

Hudson Maxim, president of the Aeronautical Society, made a most eloquent address in memory of Mr. Chanute. In conclusion he said:

"Always it has been a devoted few who have stood in the vanguard and fought the hard fight of progress.

"One of such few was Octave Chanute. He belonged to the true nobility of brains. He was a man to make the constellated eyes of heaven look our way and honor us, and the gods to boast of kinship."

Major Samuel Reber illustrated his talk on the Belmont meet with a series of lantern slides, followed by moving pictures of principal events of the tournament.

Allan A. Ryan, president of the Aero Club of America, delivered the following address:

By Allan A. Ryan.

THE astonishing progress in aeronautic achievement of the last two years and the even greater advancement that is bound to come, places at this time a certain burden of responsibility upon the Aero Club of America, and if we are to do our patriotic part in aiding this country to reach and to maintain the position it should have in this great enterprise, there is an immediate necessity for energetic and concerted work from now on.

If my interpretation of the purposes and scope of this club are correct, it is our duty to develop and advance in every legitimate manner, the science and the sport of aeronautics and to make these things the first and paramount business of the organization, and in that connection it is very gratifying to know that every requisite facility and resource for the accomplishment of this work is within the reach of the club, it being necessary now merely to enlarge and extend the institution already well established.

This is the Aero Club of "America." It is, or it should be, exactly what its name implies. Not simply the Aero Club of New York City, or New York State, or any other one section of country or one group of men, but an organization as broad as the country itself and an organization that shall embody and give representation and expression to every affiliated aero club on this continent.

The science and sport of aeronautics, in this county, as elsewhere in the world, have developed with a magic-like rapidity that has defied thus far all effort at organization and systematic control. The whole business seems to be up in the air higher even than the aviators themselves and the work before this club, is to do its part in getting things down to earth where we can begin to establish some sort of system and control.

To accomplish satisfactory results along these lines we must have cordial and permanent co-operation of all interests concerned. The affiliated clubs of the entire country must work together and the first thing to do is to find some substantial basis upon which that policy can be carried into effect. To be more specific, it is my notion that every club and every active locality in America should be fully represented in the organization. I don't care whether each affiliated club is represented by one or by forty governors on the board, so long as we can establish a harmonious and effective organization that shall represent the aeronautic interests of the whole country, in fact, as well as in name. What we are after is results. We are all striving for the same thing, substantially, the upbuilding and systematizing of the science and sport in this country and we should waste no more time in petty differences and trivial details in getting on the main job.

This business of aeronautics is no longer the special field of cranks and idlers. It is a game that men are going to play with from now on and we might as well understand, too, that it is a game that no one section of the country is going to monopolize. New York, Chicago, St. Louis, Kansas City, San Francisco and every other center in the United States is going to have its strong aero club, its aviators, its aviation fields, its special interests and enterprises and the question now is whether we are all going to work together as one happy family of the air, or continue to work apart with more or less waste of energy and opportunity, as has been done in the past.

It is my own belief that the future supremacy of this country in the aeronautic field is going to depend very largely upon the harmonious co-operation of the institutions and individuals interested in the great science and it seems to me that the time has arrived for us to decide upon that course and get to work. Naturally, the Aero Club of America should stand as the nominal head of the great national federation of clubs. It was the beginning of the aeronautic movement in this country; it is the natural representative of the International Federation and the natural parent body in the great group of American clubs. While I believe that the Aero Club of America should remain as the central and nominal head of aeronautics in this country, I believe that it should be so organized or reorganized as to give the fullest representation to every section of the country in the control of all national policies and affairs.

It is also very important in the future that we give every possible aid and encouragement to worthy inventors and to every branch of scientific development in this country and to that end we should call into association and co-operation with us all those who are seriously working, or interested in the field of American aeronautics.

A very casual survey of the world at large shows that there is much to be done in America to bring us abreast of many other countries and the only way to achieve that result is through wise and effective co-operation. Organization and effort are alone necessary. The natural resources we have in abundance.

J. A. D. McCurdy will be at Key West January 21, waiting for a favorable moment to fly to Havana, where Curtiss aviators are to hold a meet, January 28 to February 7. The Navy Department has issued orders to the commander of the torpedo flotilla at Key West to hold himself in readiness to assist in any way.

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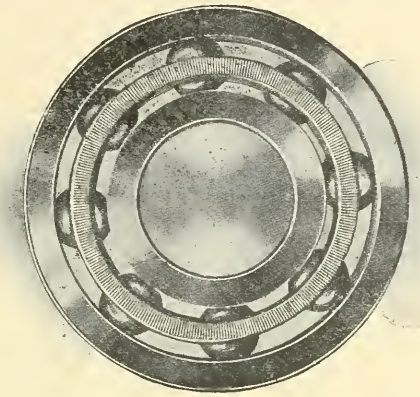

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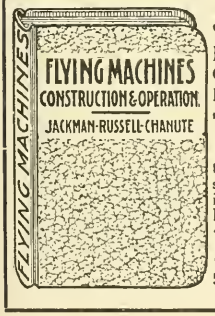

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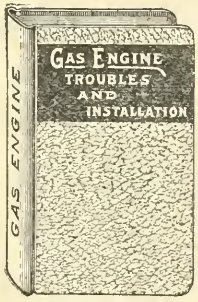

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HOW TO BUILD A CURTISS-TYPE.

(Continued from p. 46)

they may be flattened in a vise without heating, and drilled with a ⅛-inch hole. They are driven tightly on the tapered ends of the ribs, and fastened with a small screw or brad. The rear-end ferrules are ½-inch lengths of ⅜-inch tubing, driven on and drilled with a 3/32-inch hole for the rear edge wire. The rear ferrules of the main ribs may be the same ½-inch tubing used for the front ferrules of the small ribs; they should be cut off so that their ends will come in the same line as the holes in the ends of the small ribs. If the quick-detachable section plan is used, the second main rib from each end may be left long and drilled with a hole like the small ribs. The front ferrules of the main ribs should be ¾-inch tubing of a heavier gauge, and drilled with a ¼-inch hole.

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(To be continued)

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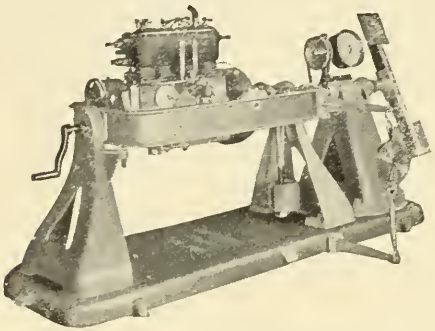

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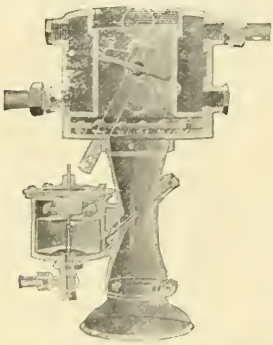

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The Aero Club of America is desirous of adding to the number of life members, the cost of life membership being very low, namely $500, considering the many advantages attached to the honor.

C. F. Bishop has been appointed first vice-president, and Robert J. Collier, head of the National Council of the Aero Club of America, has been given the post of governor, to fill the vacancy caused by the resignation of J. C. McCoy. Mr. Collier has also been named as one of the club's two representatives to the National Council, in place of Dave H. Morris, resigned. The club at the present time has 353 resident members, and 151 non-resident members. It has licensed 26 aviators, 2 dirigible balloon pilots and 37 spherical balloon pilots.

At a meeting of the board of governors of the **Aero Club of America,** held January 3, the following resolutions were adopted: Whereas, in view of recent accidents to pilots of aeroplanes it seems expedient to the board of governors of the Aero Club of America to take necessary steps to secure as far as practicable proper conditions of safety, be it Resolved, that the technical committee be instructed to recommend suitable regulations covering the inspection by proper delegates of the condition of all aeronautical material before contestants in any event, will be permitted to leave the ground, and further, Resolved, that the committee on aerodynamics be instructed to report the conditions of the air at the time of the accidents and the probable cause of the accidents.

At the meeting of the executive committee, held January 10, George F. C. Wood was appointed secretary of the club, and the resignation of the assistant secretary, Mr. Charles H. Heitman, was received. Also the Pacific Aero Club, the Aero Club of Rochester and the Aero Club of Connecticut became affiliated with the Aero Club of America.

CURTISS HOLDS SCIENTIFIC AMERICAN TROPHY.

At a meeting of the board of governors of the Aero Club of America, held January 3, the Scientific American trophy was awarded to Mr. Glenn H. Curtiss for the year of 1910, Mr. Curtiss having traveled the greatest distance while competing for this trophy during the year in his flight from Albany to Poughkeepsie, on May 29, 1910, a distance of 65.408 miles. The trophy thus became Mr. Curtiss' own property, having won it for three consecutive years. So far as known, no other entries were ever made to compete for this cup.

The **Aero Club of Long Island** at its first annual meeting, held in December, elected the following officers for the ensuing year: William Newell, president; Frederick Rockstroh, vice-president; Joseph K. Post, secretary; Henry I. Newell, Jr., treasurer; board of directors, Charles Wald, chairman; John Herbert Lisle, Francis C. Wilson, Henry I. Newell, Jr., and Howard C. Brown.

The **Aero Club of the University of Illinois** has built two gliders since its organization in 1909. The first was demolished in flights. The second was on original lines in construction and principle, and made for towed flights. This machine will be tried as soon as there is favorable weather. Experiments will be conducted upon the properties of planes in air currents and the testing of propellers. Photographs will be taken of these air currents, using the excellent equipment of the Engineering Department of the University.

The Aeronautical Society postponed its semi-monthly meeting, which came due the end of November, till December 1, when Mr. Charles D. Gibson, of the Vortex Vaporizer Co., gave a lucid and useful address on carburation and vaporization generally. He brought forward the information that while the crudest carburetors were efficient at the outset of the gasoline motor science, the same carburetors would not prove serviceable to-day, because of the great change in the gasoline procurable. The specific gravity was originally around 52 while now it averages 66 to 68, and has a sprinkling of kerosene, due to the fact that at first gasoline was a waste product, while now the Standard Oil Co. has difficulty in supplying it in the quantities required. He claimed that good vaporizers properly applied were more efficient than the best carburetors because they provide a dry mixture.

At the next regular meeting held December 8, Capt. T. T. Lovelace gave an interesting talk on his experiences in aviation in the last two years, beginning with Wilbur Wright at Pau and then going to England and finally with John B. Moisant when he came to this country and started to manufacture. B. M. Carmina gave the first essay of the seven on the complete subject of aeronautics for which his prize of a gold medal was presented to the society to be awarded to the winner. Tehnical information brought out was extremely useful and caused many questions to be asked by members.

On December 22, Messrs. Hugo Gibson, Wilbur R. Kimball and Robert Hanau took the subject of propellers for their addresses for the Carmina medal and attacked the subject from different standpoints as well as the air pressures resulting from rotating screws.

On January 12, a rehearsal of the advancement in 1910 was had, and Mr. Henry M. Neely, of Philadelphia, addressed the members with a most interesting talk, illustrated with a hundred lantern slides taken by him at the different meets in this country. This was followed by remarks from Mr. Wilbur R. Kimball, likewise illustrated with lantern slides of his own. Capt. James Prentice, U. S. A., now stationed at Fort Hancock, N. J., gave the result of his researches, which is spoken of as one of the most scientific addresses the society has been favored with, being the result of many years' experiments on living birds, mainly sea gulls. He found that he could cut away feathers from a living bird to leave hardly any surface and yet the bird would fly quite naturally, and even when this was done on one wing only the bird had no trouble in maintaining stability, but just as soon as the shape of the wing was changed by tying with string without injuring the bird then it could not fly at all. He also added to the weight of birds as much as 30 per cent. of their own weight, which would not prevent them from flying just as readily as before. These researches led him to determining that the true shape is a parabolic curve in all directions, and he was able, with very delicate anemometers, to determine where the pressures and currents exist under the wing. He took such careful measurements from living birds in flight that he was able to duplicate a bird structure artificially by means of moulds and proved the correctness of his researches by a forward flight of one of these artificial birds in a 25-mile wind blowing against it.

The full texts of these lectures are published in bulletin form and can be obtained by those interested by addressing Aeronautical Society, P. O. Box 28, Station D, New York City.

Intercollegiate Aeronautical Association. Swarthmore College Aero Club is building a glider and will construct a power machine. Dartmouth is to purchase a glider. President George A. Richardson, of the I. A. A., is to offer a trophy to the clubs in the association, to be awarded to the club securing the highest number of points on the following basis;

(1) Certain number of points allowed according to the club's activities and accomplishments along lines of research; (2) certain points on gliding; (3) power machines; (4) general activity.

STEVENS AWARDED CUP

The **New England Aero Club** will give a dinner on January 31, at Boston, on which occasion the C. F. Bishop cup will be presented to A. Leo. Stevens for the longest flight made from a New England point. This trip was made on May 19, from North Adams, Mass., a landing being made on May 20 at St. Dominique, Quebec, accompanied by Prof. David Todd, Percy Shearman and Charles Somerville. The distance is 219 miles; duration 11 hours, 52 minutes.

The Aero Club of Connecticut was formed on December 28 in New Haven with a membership of 32. The officers elected are as follows: President, A. H. Forbes (Fairfield, Conn.); vice-presidents, W. C. Beers (New Haven), Alton Farrell (Ansonia), Clarence E. Whitney (Hartford); secretary, Gregory S. Bryan (Bridgeport); treasurer, Arthur H. Day (New Haven).

The Pawtucket Aero Club (R. I.) is another new club in process of formation.

The Aero Club of Dallas (Tex.) was formed January 8 for the purpose of making a study of the science of aviation and of promoting aviation meets in Dallas. A permanent organization will be effected later. Among the charter members are Edgar L. Pike, Henry D. Lindsley, Tom L. Monagan, M. N. Baker, Murrell L. Buckner, E. J. Keist, E. H. R. Green, Clarence Linz, John V. Hughes, J. E. Farnsworth, J. R. Babcock, E. L. Scott, Emil Fretz, Elihu Sanger, E. Sanger, L. O. Daniel, W. G. Crush, and a representative of each of the local newspapers.

The U. S. Aeronautical Reserve held its first meeting on January 9. The principal speakers were Hudson Maxim, Prof. Hallock of Columbia and James H. Hare, the veteran war photographer, who told of the difficulties in photographing the Wright 1908 Kitty Hawk flights.

The Aero Club of Pennsylvania held its election of officers January 20, and the following were chosen: President, Arthur T. Atherholt (re-elected); first vice-president, Clarence P. Wynne; second vice-president, W. D. Harris; secretary, Rev. Geo. S. Gassner; treasurer, Laurence Maresch. Lieut. Jac. O. Sickel, of the United States Army, lectured to the club that same evening on "Military Aviation," showing the changes in military tactics that will be made by the flying machine.

The Dartmouth Aero Club is actively at work, and this spring should find its members up in the air. It has been decided not to purchase a new glider immediately, but to use one that has been loaned by C. A. Edison '14, and to begin construction on one for the club. Edison's glider is already here, and is being set up, and the material for the new one has been purchased. It will be started upon the close of the mid-year exams. The construction committee consists of C. A. Edison, '14, G. O. Wright, '14, and A. E. Wyman, '13.

The club has been purchasing much reading matter upon this subject, and a thorough study is being made of the problems. The officers have arranged for several authorities on aerial matters to address the club, and early in March W. C. Hill, '02, of Boston, a member of the New England Aero Club, will speak to the members. J. B. Benton, '90, of Boston, has offered to take up members of the club in his balloon early in the spring. The start will probably be made at Burlington, and they will endeavor to come towards Hanover.

The club has voted to offer a cup to the member making the best model aeroplane, and already several members have started on this work. The officers believe that in this way a practical knowledge of aeroplane styles can be learned.

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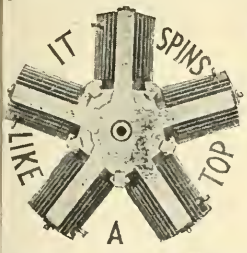

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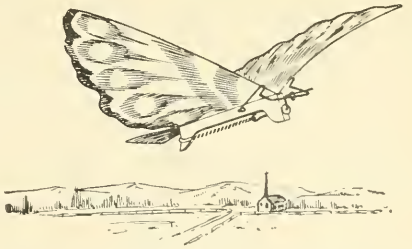

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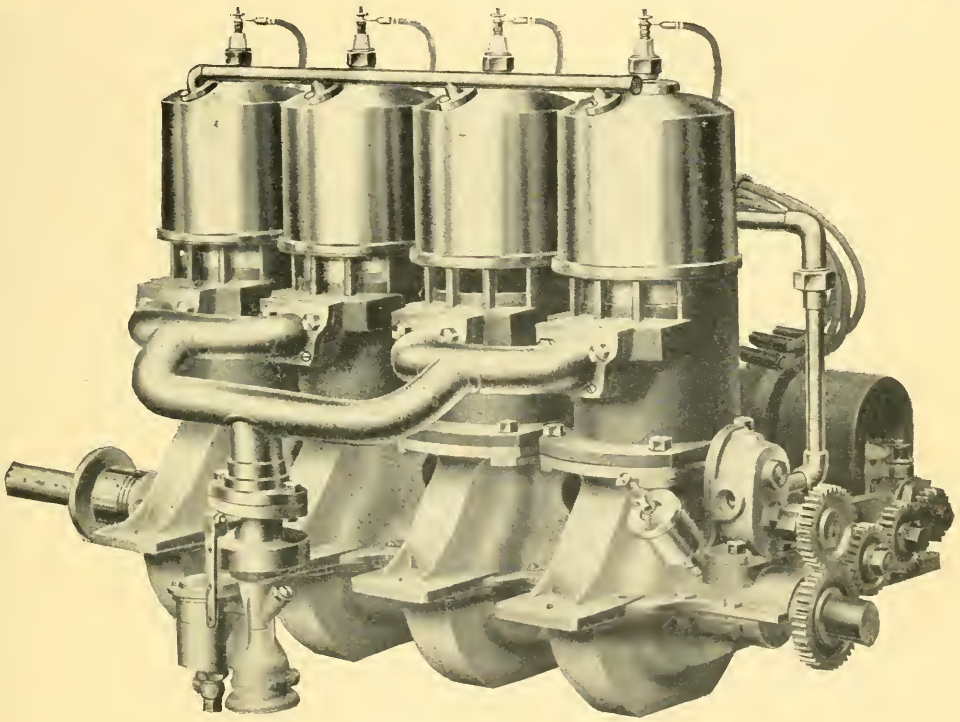

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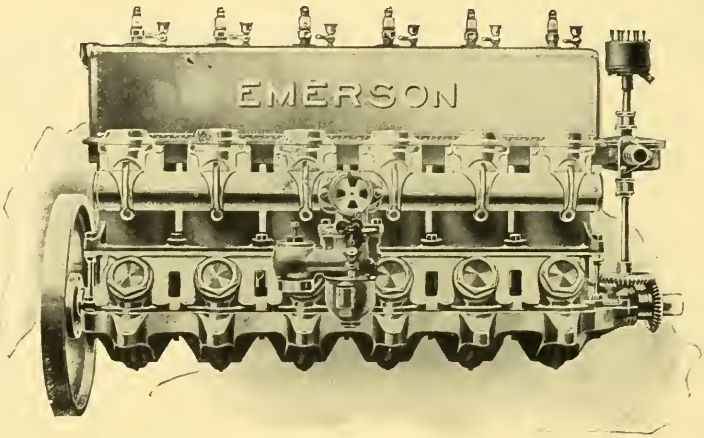

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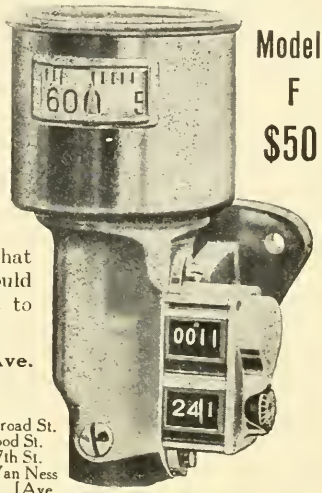

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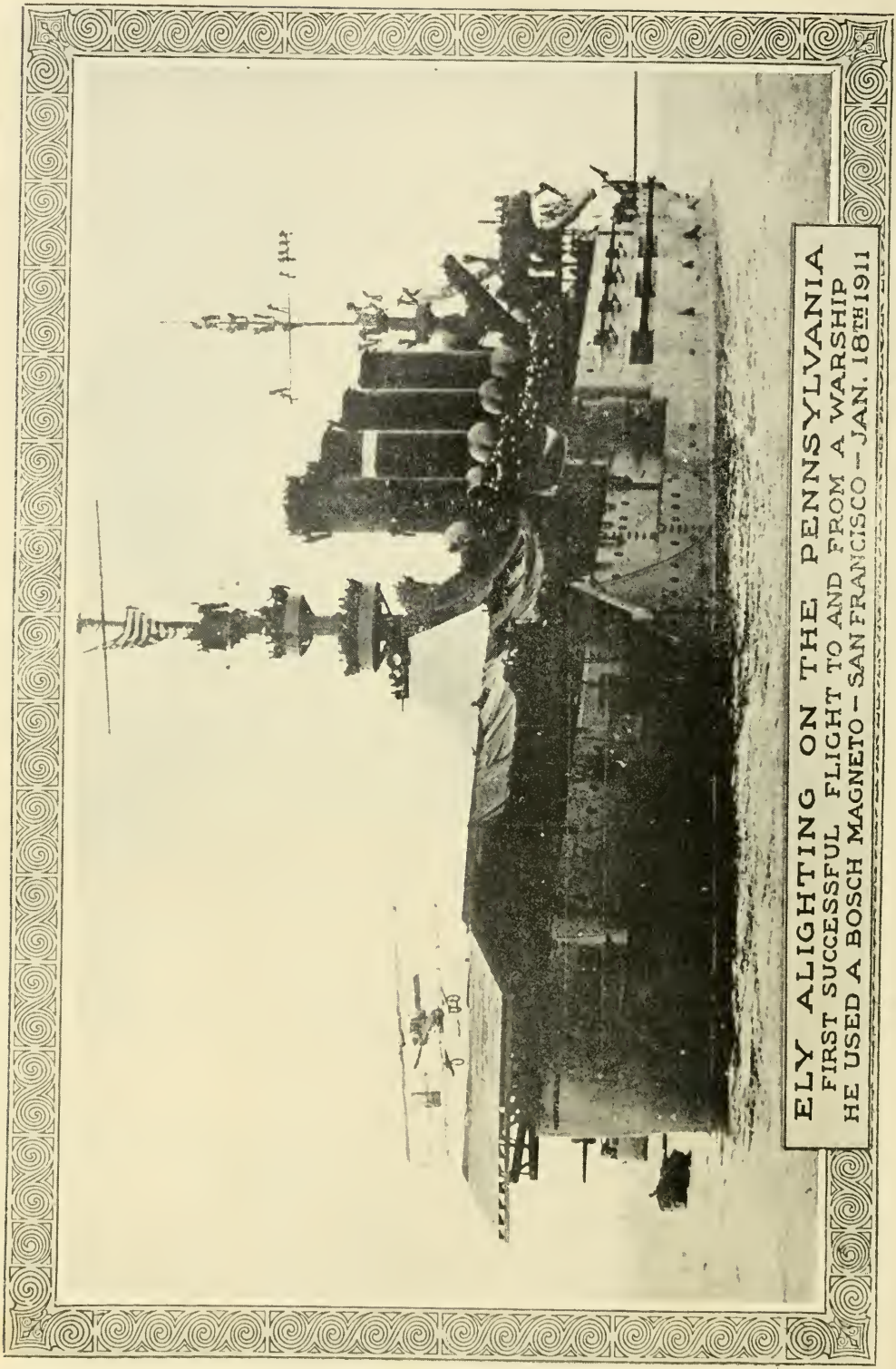

ELY ALIGHTING ON THE PENNSYLVANIA
FIRST SUCCESSFUL FLIGHT TO AND FROM A WARSHIP
HE USED A BOSCH MAGNETO – SAN FRANCISCO – JAN. 18TH 1911

Vol. VIII. Aeronautics No. 3
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THE DUNNE AUTOMATIC STABILITY SYSTEM

By T. O'B. Hubbard.

SEC'Y BRITISH AERONAUTICAL SOCIETY

MR. GRIFFITH BREWER and Mr. Orville Wright have jointly observed, on behalf of the British Aeronautical Society, the trials made by Mr. J. W. Dunne for the purpose of demonstrating the automatic stability of his biplane. The flights were made at Eastchurch, Isle of Sheppey, on December 20, 1910.

OFFICIAL REPORT.

21st December, 1910.

Yesterday afternoon we observed two flights by Mr. Dunne on his automatic stability machine, at the Royal Aero Club ground at Eastchurch.

The first flight was over a distance of about 3 miles (not timed), the machine being turned at a height of about 100 feet and making a good landing near the starting point. On the second flight of 2 minutes, 29 seconds, Mr. Dunne made notes on a piece of paper during the flight. On both flights the engine was cut off in the air before landing and the machine came down without materially altering its angle of incidence.

ORVILLE WRIGHT.
GRIFFITH BREWER.
Members of the Aeronautical Society.

WRITING TEST.

20th December, 1910.

I handed this paper (reproduced in facsimile facing this page) to Mr. Dunne just before starting on his second flight, and he handed the paper back to me immediately on landing with the words written in pencil as shown. The paper was not stiff and necessitated the use of both hands in order to write these pencil notes, thus showing that both hands were off the levers for sufficient time to make these notes during the actual flight. In descending after having cut off the engine, Mr. Dunne held both arms up in the air and resumed hold of the handles just prior to making the actual landing. GRIFFITH BREWER.

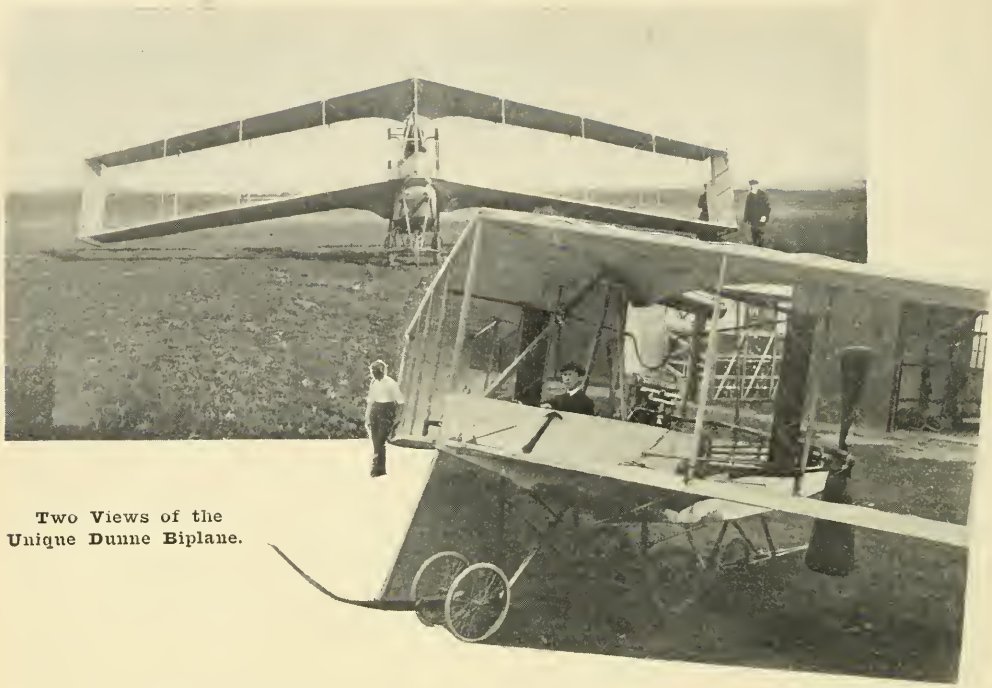
The notes made in pencil by Mr. J. W. Dunne were as follows: "Engine revs. 1400; levers normal; strong wind in face; turning now; straight again."

ACCOUNT OF THE TRIALS.

By J. W. Dunne.

The first thing to do was to show that the machine could fly as well and as directly as those of the ordinary T-shape, to exhibit the power of control and manœuvre given by the two little steering flaps, and above all to show that with this type of machine good turns, with the correct amount of banking, and no slide-slipping, could be effected without resource to the complicated "three-rudder" system. I, therefore, contented myself with a closed circuit, allowing the machine to climb 100 feet on the turn, and as this was the first time I had turned at any height, I confined my attention to making a neat job of it, and made no particular attempt to show off the automatic stability of the machine, until it came to descending. It is a well-known rule of flying that, before throttling the engine, the machine's bow should be pointed slightly downwards to avoid the loss of speed that would otherwise ensue, and it is in the proper manipulation of the levers immediately afterwards, to maintain speed and keep the machine under control, that the trained aviator has to exercise his greatest skill. To throttle without first depressing the bow, and then leave the machine severely alone, is a stiff test of longitudinal automatic stability, though, of course, no test of lateral stability. So both in this flight and in the second, I first locked the levers in the central position in which they are left while flying, then throttled, and immediately threw up my arms and left the machine to come down from the flying tilt to the gliding tilt of its own accord, and thence find its way earthward. The steep slope of the ground at the point of landing rendered it unsafe to attempt the requisite flattening of the trajectory before touching earth by the use of the throttle alone, so at the last moment I utilized the flap-controls for this purpose.

The next point was to prove the safety of the machine. As we have no place for passengers in the present apparatus I suggested that I should go round the same short circuit and carry out the "writing test." I proposed this, as I know of nothing else which so thoroughly puts to the proof the aviator's real trust in his machine's fitness to look after itself, compelling, as it does, absolute detachment of the mind. One may eat, drink, smoke, click a camera, take off one's coat, or do a hundred other things, and all the time keep one eye ahead to see what the machine is really doing, and be ready to snatch at a lever if necessary. But when writing, provided one writes sense, one's attention is perforce completely drawn away from one's surroundings. I ran down across the wind, hopped off, touched again, and then began to rise steadily. As soon as I saw that I would clear the bushes on the boundary dyke, I locked the levers, and felt for the paper and pencil given me by Mr. Griffith Brewer. The paper was in one pocket and the pencil in another; by the time I had got them ready I must have flown a considerable way. I started to set down certain points I was anxious to observe and remember. First, I counted the divisions on the revolution indicator, which has no figures between the 1,000 and 1,500 marks. When I began to set them down I found to my annoyance that it was almost impossible to write on the thin paper with only the fingers and palm of my hand as a backing thereto, and that a certain amount of excitement rendered the task still more difficult. I then observed the positions of the levers relatively to their toothed racks and made a note of that. I next looked about inside the boat for something else to note, and while doing so became aware of the violent wind in my face, which curiously enough I had entirely failed to notice on the previous flight. As I had been anxious to ascertain how far the front screen shielded the aviator I wrote this fact down. From the time I had first locked the levers, till now I had not paid the smallest attention to what the machine was doing or where it was going. I had been left to follow its own fancy, and might by this time be anywhere or in any position for all I knew. However, looking up, I saw that it was still level, but had drifted down wind and was aiming to hit a wind-pump, so I decided to commence the turn.



Two Views of the Unique Dunne Biplane.

I separated the levers, holding them till the turn had started, noted its radius, which was shorter than I required, diminished the difference between the lever positions, locked them, waited a little time, hands off, until I was satisfied with the radius of the turn and with the rapidity with which the machine was mounting, got hold of my paper again and with some difficulty wrote "turning now." Looking over the port-bow I saw a farm house nearly beneath me, and realizing that the circle was now bigger than I had intended, and also that I was much higher than I had thought, I pushed each lever into the fourth notch, and, sitting with my hands in my lap, allowed the machine to swing itself sharply round. Then I locked the levers centrally and sat back, but did not continue writing, as I was puzzled by a momentary failure to recognize the ground below me. I am not a balloonist, and am unused to heights. After a moment I realized that a little dark green blob was the pond in the middle of the ground. So I headed the machine towards it, and then wrote "straight again." By the time I had got that down I saw I should have to descend at once if I meant to get back to my starting point, so I moved the machine's nose a degree or two round, aiming at the point in question, returned each lever carefully to its central notch, throttled the engine, and held up my arms. Instantly the machine's head drooped a little, and, without any abatement of forward speed, she began to sink towards the ground. I landed her as before described.

PREVIOUS TRIALS.

Lieut. Dunne was for sometime attached to the British government "balloon factory" at Farnborough. After flights of one of his biplanes in 1908 and 1910, the machine was reconstructed and tried out again in May of 1910. The machine flew for about 2 miles with Lieut. Dunne's hands off the levers. During the flight the machine gradually rose.

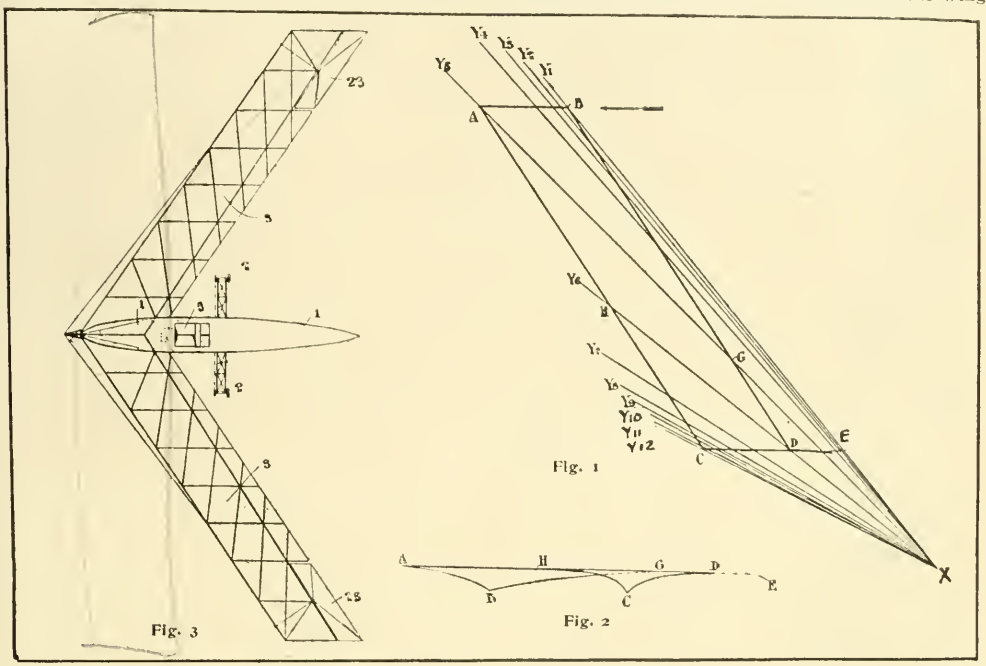
During the whole of its free uncontrolled flight, the aeroplane remained absolutely stable. The wings project backwards from the central axis of the machine, and in plan have the shape of a V with the apex in the direction of flight; the wing-tips are actually situated in rear of the center of gravity of the machine. Their combined area is 560 sq. ft. The machine carries no tail nor steering or controlling surfaces of any kind with the exception of a flap hinged to the rear extremity of each wing for effecting horizontal and vertical steering. A 4-cylinder, 50-h.p. "Green" engine drives two propellers revolving at the rear of the surfaces. The wings have a positive angle of incidence near the center, the angle gradually decreasing towards the tips, where the angle is actually negative. The machine weighs 1,700 lbs.; the load therefore being about 3 lb. per sq. ft.

THE DUNNE PATENT.

A British patent was allowed April 5, 1910 (No. 8118), covering "curvature and shape of surfaces." An abstract of this follows:

The object of this invention is to obtain a form of aeroplane which shall possess, solely by the form and arrangement of the surfaces, automatic stability in still and agitated air and freedom from oscillation. The inventor has found that twisting the wings of an aeroplane involves the disadvantage that sections, either longitudinal or transverse, taken across the wing-tips, give curves that are more or less concave on their upper sides, thus failing to give large pressure reactions, and that when such wings are twisted the changes brought about in the pressures by the concave portions are so abrupt as to produce unsteadiness, and that the similar concavity on the transverse sections produces lateral instability. The two essential conditions to be observed are to decrease gradually the angles of the fore and aft cross-sections of the wings from root to tip without producing points of inflexion in the surfaces, and, secondly,

to maintain considerable differences in the angles of the inner and outer portions without too much loss of pressure under the outer portions. The present invention consists in constructing each of the main surfaces as a rearwardly projecting wing, whose angle of incidence decreases from the root to the tip, and by shaping the wing so as to compress air between the positively inclined portion of the wing near the root to the negatively inclined portion near the tip. The wings must be so sloped backwards along their leading edges that the wing-tips lie behind the center of gravity of the whole aeroplane. Further, each wing is so constructed



that its upper face is formed as a portion of a cone or a cylinder, the angle of incidence of the wings decreasing toward the tips, and in some cases changing sign. Figs. 1 and 2 show a plan and side elevation respectively of a form of wing in which the upper face forms part of a conical surface, with the apex at the rear, the left-hand wing only being shown, the center line of the machine being indicated by the arrow; Fig. 3 shows a plan of a monoplane built according to this invention. In the form of constructing a wing surface according to this invention, shown in Figs. 1 and 2, the upper wing surface is swept out by the straight line X Y1, which always passes through the rearwardly situated point X and travels along the guide curve E C so that it takes up the various positions X Y2, X Y3 . . . X Y12; the surface thus swept out evidently being a portion of that of a cone. By selecting that portion of the conical surface indicated by the parallelogram A B C D, the angles of incidence of the fore and aft sections of the wing gradually decrease and change sign toward the tip. Further, owing to the larger angle of incidence at the leading edge along the inner portion of the wing, the air is forced downward and outward, thus transmitting pressure to the underside of the wing near the negatively inclined tips, and is, in addition, compressed under the tips, which can consequently be inclined at a considerable negative angle without incurring loss of lifting power. The full-size machine shown in Fig. 3 illustrates a monoplane built according to this invention. The wings, 3, are connected to the body, and are sloped backward so that the wing tips lie behind the center of gravity, situated at or about the point 5, where are fixed the motor and pilot's seat. A pair of propellers are situated at 22; the rear wing tips are fitted with flaps 23 for steering vertically and horizontally.

INSURANCE FOR AVIATORS

So far as known, there is not a single insurance company in this country writing life insurance for either aviators or aeronauts. Companies writing accident insurance in all cases where the applicant is known to be engaged in any way in aeronautical work, attach riders to policies limiting the death payment to but $250 in place of the $5,000 face value of the policy. The editor of this magazine even had to accept this fool regulation.

We have received requests from men in the aeronautical industry for the names of companies who will write life insurance on aviators and aeronauts, and also fire and other insurance on the machines themselves.

The Glasgow Assurance Corporation, Ltd., now advertises "aviators insured against accidents of all kinds at moderate rates," and claims the honor of being "the first company in the world to undertake aerial insurance." This is an encouraging announcement and no doubt American companies will some time in the future follow suit.

While no insurance is being written on lives of aviators, "Aeronautics" is informed by the New York Board of Fire Underwriters, as a result of some correspondence, that there are a number of companies insuring aeroplanes and balloons. Those desiring fire insurance on aeroplanes or balloons should make application to the local agent.

H. J. French, 1306 E. Ocean avenue, Long Beach, Calif., is building a monoplane of his own design, to be equipped with a 35-h.p. Holbrook motor.

THE NEW SOUTHARD MONOPLANE

THE machine known as the "Southard II" has been developed by W. Wilson Southard, 421 N. Fulton avenue, Baltimore, Md. The previous machine was destroyed, as mentioned in the previous issue. The number two machine is nearly completed and will shortly have its trials at College Park.

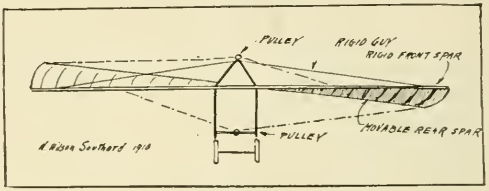
The appearance presents a cross between a Bleriot and an Antoinette. The former has been followed in the body, running gear and wings, while the spread of 34 feet approximates the Antoinette, and likewise the tail. It is desired to combine the simplicity, neat appearance and effectiveness of the Bleriot with the stateliness of flight of the Antoinette. The horizontal and vertical controls are similar to the Bleriot, but the stability control is original.

The main spars (back) are hinged to the body, permitting a whole movement of the spar, with a solid joint. This system was illustrated in the February number. The upper bracing wires run through pulleys clear over to the other side, making one unbroken set of wires above from wing to wing. The same thing is followed below.

The front spars are trussed rigid, both above and below, to the triangular brace with snap-hooks and around the spring landing tube beneath the lower spar of the front frame, below.

The lever is simply connected up to independent wires running out to the wing tips, same as the warping wires on other machines, but are not to take any lift other than the warping strain. It is claimed questionable by the builder whether these wires are needed, as it is expected the reaction of the wind pressure under one plane will automatically shift the other, giving a semblance to automatic stability. The machine never has, however, been tried without the warping wires being connected, but will be tried out cautiously in the future.

The engine is a 165-lb. Roberts 2-cycle, water cooled, of 40-50 h. p. Two El Arco radiators will do the cooling. It is figured that



Southard Stability System

the Paragon propeller will give about 11 lbs. thrust per horse power. Mea magneto is used, with Kingston carburetor.

Spruce, ash, Norway birch and poplar has been used. No. 27 ga. piano wire is used, with turnbuckles. The wings are covered with Goodyear fabric. The weight is but 508 lbs. The main surface has 200 sq. ft., the tail 80, the elevators 20 and the tail 10 sq. ft.

A flight will be attempted from Baltimore to Washington. Mr. Southard is being assisted by Courtland Wrightson.

NATIONAL COUNCIL AND AERO CLUB

AT the meeting of the Executive Committee of the "National Council of the Aero Club of America," held February 7, the Sub-committee (Allan A. Ryan, A. T. Atherholt and James King Duffy) appointed at the last meeting of the National Council to consider changes in the plan and scope of the National Council, reported progress, and asked that its functions be continued during the brief interval required to carry into effect the recommendations contained in its report.

The committee gave consideration to the relations which exist between the National Council and the Aero Club of America, and, after an exhaustive comparison of the Constitution and By-Laws of each organization, came to the conclusion that it will be necessary to effect a new agreement between the National Council and the Aero Club of America. At the present time each of these bodies is exercising similar and conflicting powers.

The committee recommended that a conference committee of five be appointed to confer with a similar committee from the Aero Club of America to the end that a new basis of agreement between the two bodies may be arrived at.

NATIONAL COUNCIL SUPREME—NEW NAME.

The "Conference Committee" was instructed to negotiate according to the following suggestions:

"1. The recognition of the National Council as the body of paramount authority in national affairs and independent of the Aero Club of America, except in so far as the rules subsisting between the Aero Club and the International Federation make it necessary for the National Council to act with the club, in order to preserve adherence to such rules and to secure its rights thereunder.

"2. That the name of the National Council be changed from the 'National Council of the Aero Club of America' to 'National Council of the Aero Clubs of America.'

"3. That all committees of the National Council shall act in their own right and independently of the officers or committees of the Aero Club of America, except as to those committees, where it is necessary to obtain the sanction of the International Federation through co-operation with the Aero Club of America, and these shall be joint committees.

"4. That on the basis of recognition of their mutual relations, as herein outlined, the Aero Club of America shall extend its privileges to every member in good standing of clubs affiliated with the National Council, and that every club represented in the National Council shall extend similar privileges to each member of the Aero Club of America.

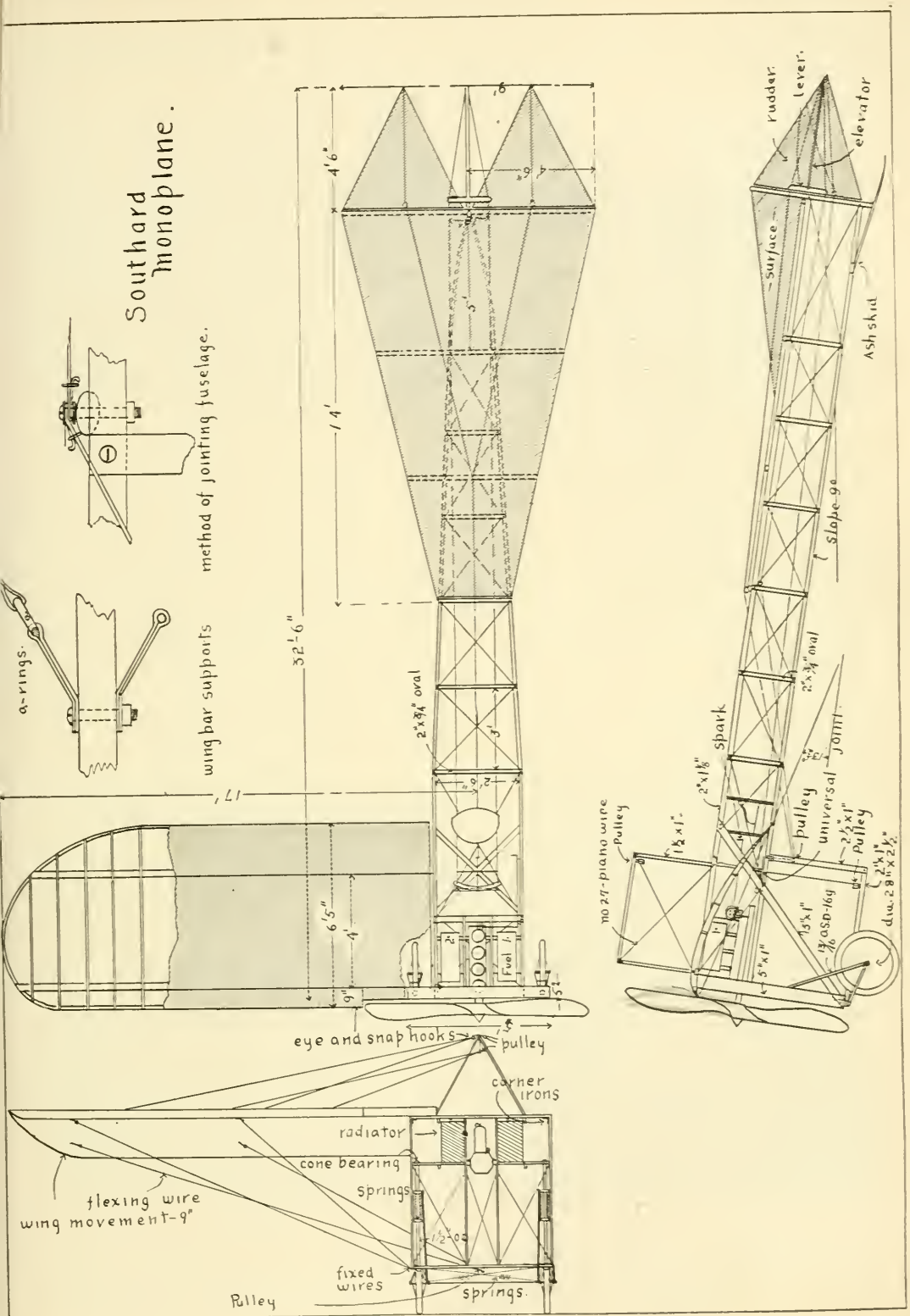
"5. That an agreement be reached between the National Council and the Aero Club of America whereby the conditions for affiliation shall be made the same for both organizations.

"6. That the Conference Committee be empowered to make such other and further agreements which may the better carry into effect the purposes of the conference, which should be declared to be the absolute and permanent harmonizing of interests between the body representing the clubs of the country at large and the Aero Club of America."

The Secretary was instructed to write to the Aero Club of America asking that a Conference Committee be appointed to confer with a similar committee appointed on behalf of the National Council.

The report of such joint committee is to be submitted to the Chairman of the National Council at as early a time as possible, and not later than February 25, 1911, in order that the Executive Committee may be called together to pass upon the results of such conference and submit its conclusions to the members of the National Council at least thirty days in advance of the stated meeting of the Council to be held April 4, 1911.

The Committee on Conference is as follows: Messrs. Robert J. Collier, James King Duffy, Jerome H. Joyce, Arthur T. Atherholt and John C. Eberhardt.



Southard II Monoplane.

SUCCESS OF THE CURTISS HYDRO-AEROPLANE

By Prof. H. La V. Twining

SINCE the first successful flights, rising from the water, made at the Curtiss winter camp at San Diego (Calif.) on January 26, 1911, an entirely new system for floating the machine was put in use and the first flight with this was made February 1.

The new pontoon is a simple, compact affair. Instead of two separate floats, a water shield and small wooden hydrosurface with which the first successful water experiments were made, the apparatus used consists of a single pontoon fastened to the under supports of the ordinary Curtiss racing biplane.

It resembles a flat-bottomed boat covered with canvas to make it water proof. The pontoon is 12 ft. long, 2 ft. wide and 12 in. deep. At a distance of about 3 ft. from the front end the bottom breaks upward, forming a sharp bow the full width of the float and on a level with the top. The same distance from the rear end the top slopes downward, both ends being so near the same proportion that either could be used as the bow of the pontoon.

The float is fixed beneath the planes in such a manner that the weight of the engine and planes, with the aviator in his seat, is carried slightly in the rear of the middle of the pontoon, giving the bow an upward tilt, which materially assists the craft in rising from and alighting on the water. The new apparatus weighs about half as much as the pontoons and other gear used in the experiments last week, and at full speed has much less surface in contact with the water.

The framework extending from the front elevator down to the water supporting the small hydrosurface and spray shield of the first device, shown in the photographs, is done away with.

Photos of this second apparatus have not yet been obtainable.

Both the Army and Navy were represented at both the experiments from the Curtiss grounds, which are located on North Island, the former by Lt. John C. Walker and the latter by Lt. T. G. Ellyson, both especially detailed. Lt. Paul Beck of the Signal Corps and Lt. G. E. M. Kelly of the Infantry have now attached themselves to the camp.

When Ely flew from the deck of a battleship on the Atlantic Coast, and some weeks later landed on the deck of a battleship in the bay of San Francisco, he accomplished a great deal to make the aeroplane a practical instrument of naval warfare; but when Glenn Curtiss arose from the quiet waters of San Diego Bay, and, after flying as much as he liked, settled upon the water as gracefully as a duck, a still greater step was taken in the same direction.

Curtiss had taken off the wheels and substituted floats in their stead. In order to support a machine of the Curtiss type it would require the displacement of considerable water.

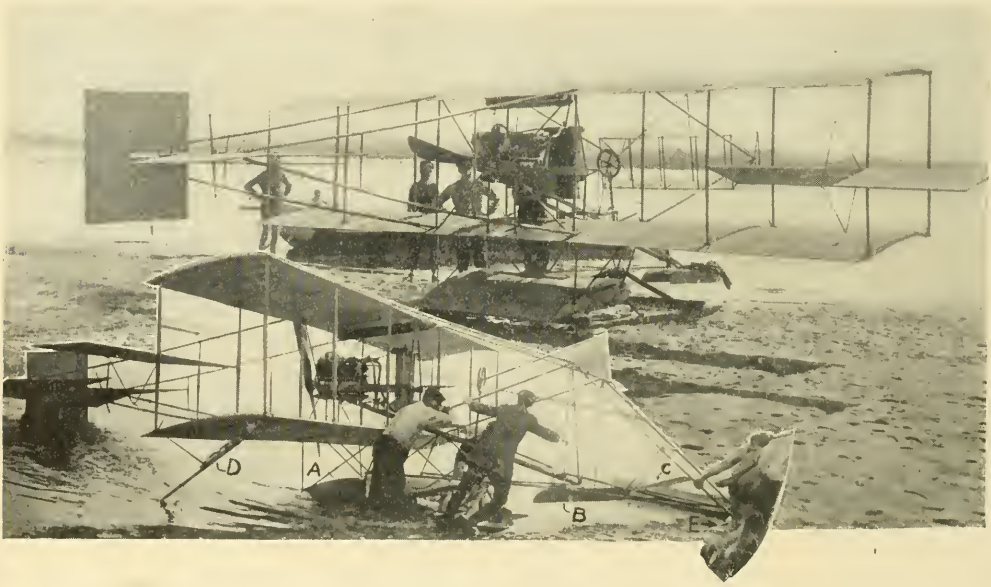
The float itself is made of metal over a wood frame, and air tight. It has a very much flattened elliptical cross section from front to rear. This is placed in the center of the machine under the engine, down where the skids would be.

The length over all is 7 ft. 1 in. long, 6 ft. 1 in. wide. It is 10 in. deep in deepest part, tapering from that point 4 ft. 10 in. to the front edge and 27 in. to the back edge. Top about 3 in. above water when floating at rest.

Another float was used in place of the usual front wheel. This is 3½ ft. long, 6 in. deep, including flanges, or 4¼ in. deep without them; 16 in. wide. These measurements and diagrams were given me, with Curtiss' permission, by his chief mechanician, D. C. Merrill.

At the extreme front of the machine is a framework. Just touching the water is a small hydrocurve surface and a canvas spray shield, all of which were later discarded.

When placed in the water these pontoons float the machine. Upon starting the pro-



Two Views of the Curtiss "Hydro-Aero-Plane." A Is the Main Float, B Is the Forward One, C Is the Canvas Spray Shield, D Aid in Keeping Machine Horizontal in Getting Going and E Is the Small Hydrosurface at Extreme Front. The Upper Photo Shows the Machine During Preparation.

Curtiss Hydro-Aeroplane Just About to Leave Water.

peller the machine moves over the water, developing great speed. As the elevators are tilted, the aeroplane gracefully rises from the water. Upon alighting the floats cause it to skip, much as a flat stone skips when thrown along the water, until finally it settles and skids along like a duck that makes a quick descent into the water.

On January 26 he made three flights. He arose on his first flight at 1.15 p. m. and stayed up 1½ minutes. On his second flight he circled with as much ease in the air as though he had no floats to carry, and flew for 2 miles over the bay, coming back and alighting within 100 feet of his shed.

These hydroplanes are more or less similar to those of Henri Fabre, who, on the 28th of March, 1910, made a flight of 5 or 6 kilometers at Martiques, France, having risen from the water. In attempting to alight he met with an accident and was thrown into the water.

This accomplishment means that an aeroplane can be carried aboard ship disassembled. When occasion requires it can be assembled in a short time. It can then be set in the water from the deck and after making its flights it can settle near the ship and be hauled aboard. Under these circumstances it can at least become the eye of the fleet, and what other possibilities are in store for it yet remain to be developed.

STATE REGISTRATION OF AEROPLANES

CALIFORNIA and Connecticut both have had bills prepared, which are now before the legislatures, on the subject of registration and control of aeroplanes. California has even introduced the subject of lights. The automobile law has been followed fairly closely in this. Two years ago "Aeronautics" printed the first law in the United States on the subject—a series of municipal ordinances adopted by a town in Florida. The bill before the California legislature is as follows:

TEXT OF BILL.

Section 1.—The words and phrases used in this act shall, for the purposes of this act, unless the same be contrary to or inconsistent with the context, be construed as follows: (1) The "motor vehicle" shall include all vehicles propelled by power, other than muscular power. (2) "Drivers" shall include any person or persons in control of such vehicle, as owner.

Sec. 2, Sub. 1.—Every person hereafter owning and operating a motor vehicle which is designed to navigate above ground in the air, for every such vehicle owned by him shall cause to be filed in the office of the Secretary of State a statement of his name and address, with a brief description of the said vehicle or vehicles, to be registered, including the name of the maker, factory number, style of vehicle and motor power, on a blank to be prepared and furnished by such Secretary of State for that purpose. The filing fee shall be $2.

Sub. 2.—The Secretary of State shall thereupon file such statement in his office, register such motor vehicle in a book, or index, to be kept for that purpose, and assign it a distinctive number.

Sub. 3.—The Secretary of State shall forthwith, on such registration and without other fee, issue and deliver to such owner of such motor car a seal of suitable metal, circular in form and not over two inches in diameter, and have stamped thereon the words: "Registered Air-Motor Vehicle No. —, State of California," with the registration number inserted therein, which seal shall thereafter at all times be conspicuously displayed on such motor vehicle to which such number has been assigned.

Sub. 4.—Every such motor vehicle shall also at all times have the number assigned to it displayed on the vehicle in numerals of over twelve inches in length, with an abbreviation of the name of the State in the following manner: "Cal."

Sub. 5.—The provisions of this act will not apply to owners of motor vehicles residing out of this State, temporarily using such motor vehicles within this State.

MUST DISPLAY LIGHTS.

Sec. 3, Sub. 1.—Every motor vehicle propelled by its own power in the air above ground shall, when being so propelled after darkness, display not less than four lights, one in the center of the vehicle in front of the driver, one at the extreme rear of such vehicle, and one at each end of the lifting planes of such vehicle, the last two to be, one red and one green, the red light to be placed at the end of the right plane, and the green at the end of the left plane. Such lights must be displayed at all times, after darkness, the said vehicle remains in the air above ground.

Sec. 4, Sub. 1.—The violation of any of the provisions of this act by any owner or driver or operator of any motor vehicle as hereinbefore described, shall be deemed a misdemeanor, punishable upon conviction thereof, by a fine not exceeding $100.

NEW MODEL CURTISS BIPLANE

Latest Curtiss.

ELY'S new Curtiss was an object of great interest, especially after his cruiser flight at the San Francisco meet. A number of modifications and improvements are in evidence. Some of the most noticeable improvements are: The pivoting of the ailerons from the rear struts instead of the front ones. This is a good feature, as the interference of the ailerons when pivoted to the front struts and placed between the planes no doubt lessens the lift of the plane above.

Head resistance is cut down by double covering the planes enclosing the ribs and beams (of which latter there are three), and changing the double front elevator to a single surface, the axis of which is placed only 6 ft. 9 in. out in front and has but two short stays of bamboo between the wheel and elevator instead of the many pieces and elaborate structure heretofore used for staying. Two rear tail flaps work in conjunction with the front elevator, being pivoted at a point about 13 ft. back from the rear edge of main planes.

Two triangular stabilizing fins are used instead of the usual plane. Their angle of incidence is about 2 inches and can be easily changed by the removal of four cotter pins.

The rudder is placed between the two rear flaps and is pivoted 6 inches back from its front edge, being moved by a tiller post, or forward extension, to which the steering wires attach, instead of fastening wires directly to a rudder.

Strut sockets are of a new type. A steel clamp of U section fits over the front of beam, the strut socket being integral with clamp. Two ¼ inch steel bolts pass through clamp and beam on either side of socket, to which the steel loops holding the turnbuckle nipples are secured by a lock washer and nut. This seems a better method of strut attachment than the familiar single bolt socket, but, however, is not new with the Curtiss machines, having been in use for some time on the coast.

The rear beam is only 6 inches from rear edge of planes, thus making the rear portion of planes inflexible and, accordingly, more sensitive to wind gusts. This would appear to be a detrimental feature.

Spread, 30 feet; chord of planes, 4 feet 2 inches. Camber apparently unchanged from standard. Planes, 4 feet 5 inches apart.

Front elevator, 2 ft. by 6 ft. 3½ inches, has a small, vertical triangular section fixed above.

Weight stated 750 pounds. Regular Curtiss propeller and 8 cylinder Curtiss 50 h. p. motor.

Laminated engine base is supported in the rear by steel tubing, which is also used to brace the entire rear center section. In front the base is bolted to two short laminated struts, the height of the base 14 inches. Above this a triangle of 1 inch oval steel tubing extends to the top plane, where it is secured by a bolt.

Engine is placed 9 inches rearward from rear beam and the canvas seat is out forward of front beam 8 inches.

Two torpedo gasoline tanks are attached under top plane. The El Arco radiator is in usual place.

One of the new type steering posts is used, with the rudder wires inside.

—CLEVE T. SHAFFER

"MADE IN TACOMA" AEROPLANE MAKES FLIGHTS.

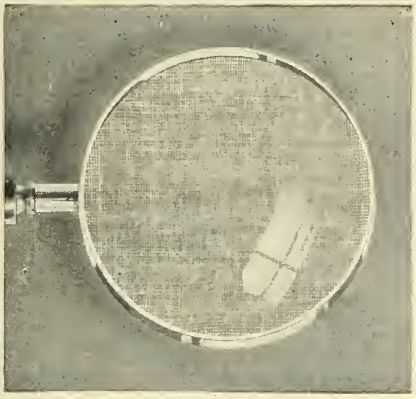
Nerved by eleven years' experience as a professional balloonist and parachute jumper, Harvey Crawford, twenty-two years of age, thrilled between 300 and 400 spectators at Lakeview, near Tacoma, Wash., on Jan. 21, with three successful flights in the first "made in Washington," also "made in Tacoma" aeroplane that has thus far been able to get off and stay off the ground.

Traveling at a speed he estimated at between forty and fifty miles an hour, young Crawford flew a mile and a half at an elevation of 100 feet on the first attempt; two miles at the same elevation on the second attempt, and two miles and a half at an elevation of 200 feet on the third flight. He would probably have completed the five-mile lap of the aviation field at Lakeview had not a stiff wind been blowing and had he not promised before starting to refrain from taking any untoward chances.

They might never have achieved yesterday's success had it not been for W. E. Colvin, of 6727 South E Street, a retired and wealthy Texas cattleman, who also had become interested in the science of aviation. Colvin took a liking to the Crawfords and offered to furnish part of the "sinews of war."

The Crawford-Colvin biplane looks very much like a Curtiss biplane. The framework and ribs are of laminated spruce. The wings and planes are covered with Baldwin aeroplane cloth and have a total surface of 300 square feet. The engine is a 50-horsepower Call aviation motor, two cylinders, double opposed, and weighing 150 pounds. It is connected to a wooden propeller 6½ feet in diameter and revolving 1,500 to 1,800 times a minute when the motor is running normally.

Two Aeroplane Safety Achievements



Goodyear Aeroplane Fabric, a rubberized waterproof cloth that is not affected by dampness, cold or heat, is the only **SAFE** material for aeroplane wings. Plain, varnished or "treated" fabric, when dampened, shrinks and **relaxes,** flaps on the wings, cuts down speed and is dangerous.

Goodyear fabric holds the wings rigid, regardless of aerial conditions, for it is **rubberized.** It is the lightest fabric for its purpose ever achieved. Its invention is the result of exhaustive investigations in France, Germany, England, Switzerland and America by six experts.

Goodyear Aeroplane Fabric is the safest, LONGEST-LIVED aeroplone cloth known to science.

The Wright Company experimented for months trying to get the proper covering for their planes. They bought various foreign and American fabrics, but none was successful until they found Goodyear Fabric. They found this wouldn't shrink and stretch. Now **the Wright Company uses Goodyear Fabric exclusively.** Burgess Company & Curtis, the Metz Co., the Lovelace-Thompson Co., the Detroit Aeroplane Co., Wilcox, and practically all the manufacturers of the country, as well as many of the most prominent aviators, use Goodyear Fabric. These pioneers know what covering is best. Another **SAFETY** achievement is the

GOODYEAR Aeroplane Tire

World-famed aviators have equipped their machines with **Goodyear Aeroplane Tires.**

Charles J. Hamilton and all of Moisant's Crew of International Aviators, Capt. Thos. S. Baldwin, J. A. D. McCurdy, Clifford B. Harmon, Harkness, Wilcox and scores of other American and foreign aviators have adopted the Goodyear and conclusively proved to themselves its superiority over every other tire.

In the tape in the base of each tire are 42 wires—21 on each side—which hold it to the rim so firmly that, when landing, it cannot jerk loose. It has greatest possible resiliency and an **extra-tough tread,** hence is almost non-puncturable.

The extreme lightness of the tire is another point of vast superiority over every other tire.

Goodyear rubber shock absorbers are also being adopted by large numbers of American and foreign aviators.

The Goodyear Tire & Rubber Company

Main Office and Factory, Ninety-fourth St., Akron, Ohio

Branches and Agencies in All the Principal Cities (144)

Grahame-White Biplanes

Convertible Type for One or for Two Passengers

RELIABLE — FAST

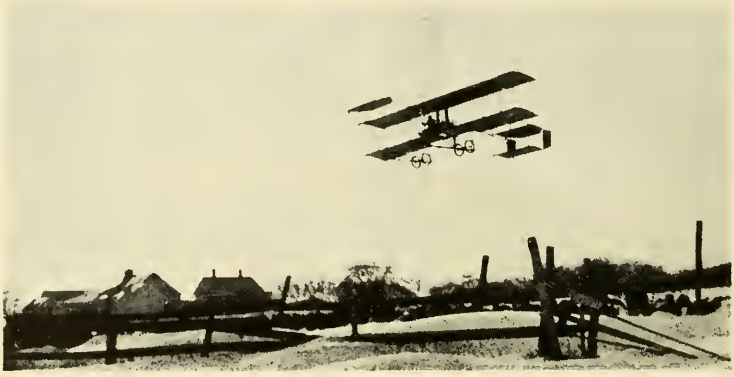
Built to the exacting requirements
OF
Mr. C. Grahame-White
BY
Burgess Company and Curtis

Marblehead, Mass.

BURGESS BIPLANES

(Licensed under the Wright patents)

Single-passenger models B and C. Two-passenger model D.



MODEL D IN FLIGHT

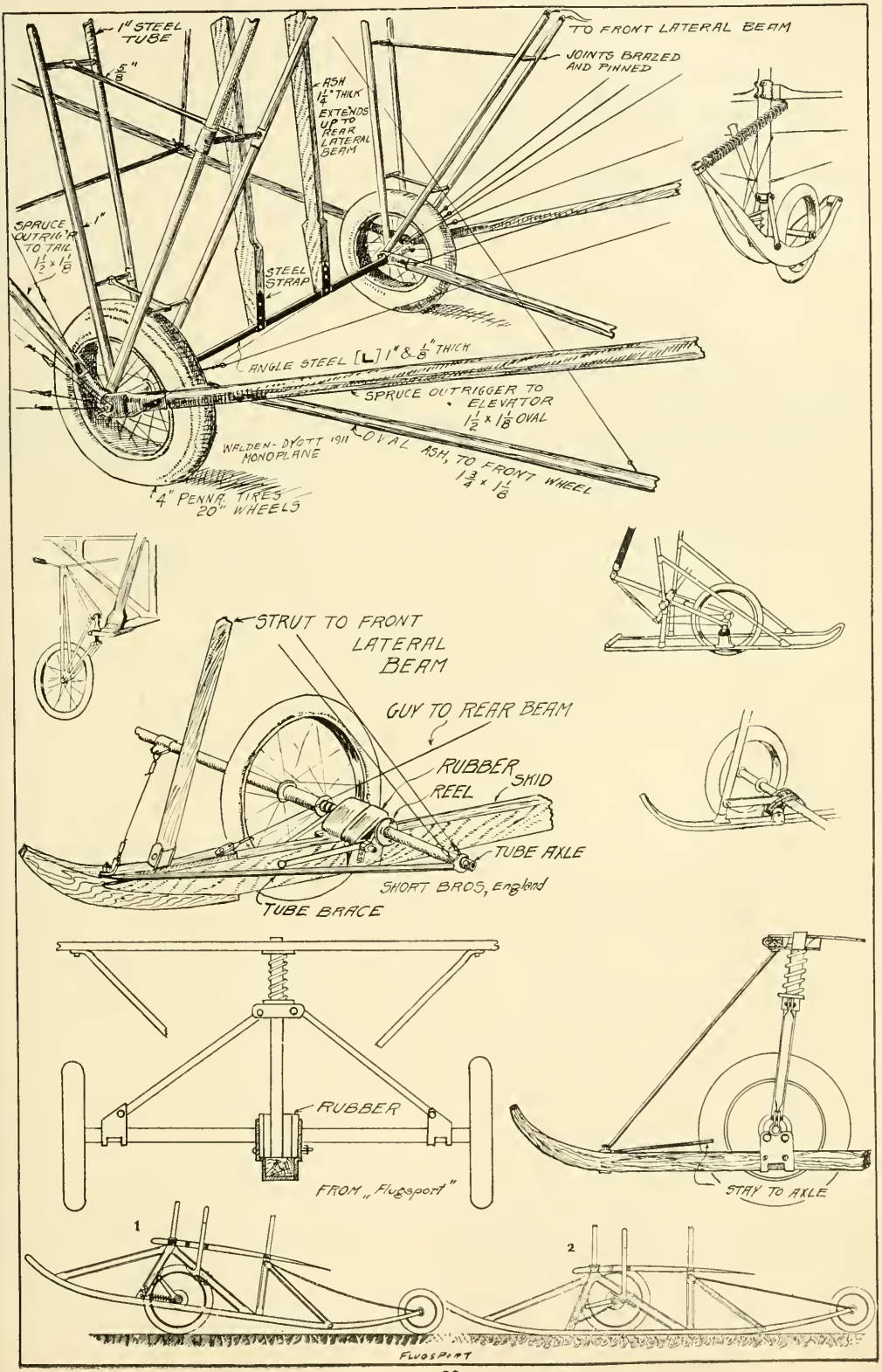
Two Striking Endorsements:

¶ Mr. C. Grahame-White's first order was for SEVEN Biplanes designed and built by us.

¶ The Wright Company, on account of the excellence of our construction, invited us to become the first manufacturers in America licensed to build aeroplanes under their patents.

Burgess Company and Curtis MARBLEHEAD, MASS.

CONSTRUCTION AIDS XVII.



FLIGHTS ABOUT THE COUNTRY

Walter Johnson Flying the Thomas Machine.

McCURDY MAKES LONGEST OVER-SEA FLIGHT.

May Be New American Record.

LONGEST AMERICAN CROSS-COUNTRY FLIGHTS.

Hoxsey (Wright), Springfield-Clayton, Mo.	89.6 miles
Brookins (Wright), one section Chicago to Springfield flight.	86.5 miles
Hamilton (Curtiss), New York-Philadelphia	74.3 miles
Curtiss (Curtiss), Albany-Poughkeepsie	71.2 miles
Parmalee (Wright), Dayton-Columbus	60.8 miles
Curtiss (Curtiss), Cleveland-Cedar Point, over water.	60.5 miles

After flying about [illegible] miles and staying in the air 2 hours and [illegible] minutes in his Curtiss biplane (51-h.p. Curtiss 8-cylinder motor), J. A. D. McCurdy, the fifth man in the United States to fly, and who is now flying for the Curtiss Exhibition Co., was forced to land in the water about 10 miles from Havana on an attempted flight from Key West, Fla., to Havana, where Curtiss aviators were holding a meet. A leak in the oil reservoir caused the trouble. The exact distance, as kindly furnished AERONAUTICS by Mr. Williams Welch, of the U. S. Signal Corps, from the anchorage at Key West to the anchorage at Havana, is 103 statute miles. Assuming that McCurdy landed exactly 6 miles from shore and 10 miles from the center of Havana (as reported), his distance would be 99½ miles if he landed west of Havana and 94½ miles if he landed northeact of the city. According to information, though not definite, the Navy Department sets the distance at about 90 miles.

After many days of waiting for good weather, the flight was started on January 30. Four torpedo boat destroyers were strung out over the course between Key West and Morro Castle.

Within sight of land poor McCurdy had to descend. The "Paulding," U. S. N., was close by, and the aviator and his machine were placed aboard and taken to Havana.

In spite of the accident, the Havana "Post" awarded its $5,000 prize, and the City of Havana has done likewise with its $3,000 prize.

This flight is perhaps the longest cross-country flight yet made in America and is a new world record for over-water flying. The previous record was that of the late Hoxsey, 89⅝ miles. Accurate data on the exact spot of McCurdy's alighting is impossible of obtaining.

NEW THOMAS "HEADLESS" BIPLANE.

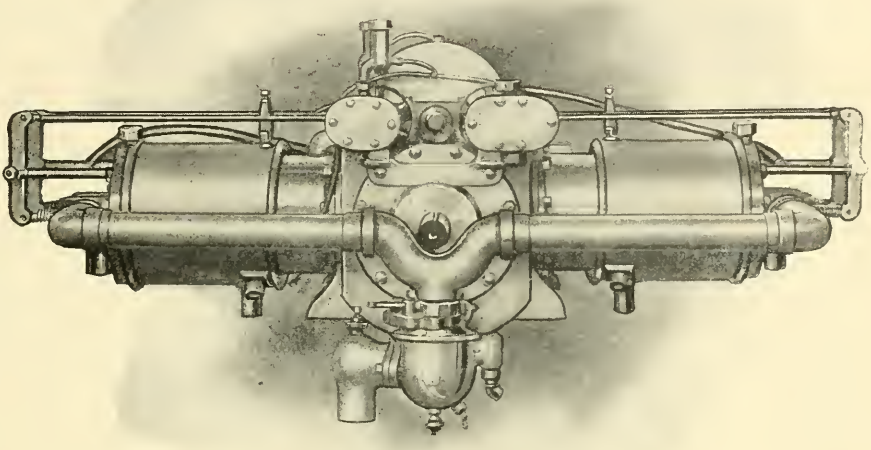
The illustration herewith shows the new "headless" biplane just finished by W. T. Thomas, of Bath, N. Y. Some very good flights have been made with it by Walter Johnson, who will do the flying for Mr. Thomas, the longest being ten circuits of the lake, which is 1¼ miles around.

There are three superposed ailerons on each side of the machine, the upper and lower hinging to the main lateral beams and the center one hinging on the rear strut. These move all together through the use of a light, vertical strut at the rear edges of these ailerons. For steering in a horizontal plane there are four small, independent rudders. Vertical steering is by the horizontal surface in the rear. The running gear steers in conjunction with the vertical rudders. The engine is a 4 cylinder Kirkham, driving direct. The machine weighs 850 pounds, and the supporting surface totals 320 square feet. A set of double surfaced extensions are being arranged to put on the extremities of the planes for the purpose of obtaining more surface for lifting at a slightly lower speed, and a new 6 cylinder Kirkham will be installed shortly.

The CALL AVIATION ENGINE

STANDARD OF

Light Weight Motor Excellence



The Sensation of the "International Aviation Tournament," New York City, and the "Three-States Aero Show," Philadelphia, Pa.

As Light as the Lightest of Aviation Engines
As Strong as the Strongest of Automobile Engines

¶ Especially designed and constructed for permanent hard duty. This is the engine you are looking for; it is the engine you will eventually adopt.

MODEL E-1a: Two Cylinder; 50 Horsepower, weight, 175 lbs. - Price $1,000
MODEL E-2a: Four Cylinder; 100 Horsepower, weight, 325 lbs. - Price $2,000

Prices include complete equipment, No Extras—COMPLETE ENGINES IN STOCK

¶ *Write* for particulars and price of our *Reversible Aerial Propeller.* Also of our *Combination Radiator and Heater,* constructed of aluminum tubing. Utilize the heat of your engine for the comfort of your passengers. Weight two pounds per gallon of jacket water.

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of the World

VULCANIZED RUBBER MATERIAL
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Rubber Fabrics for Balloons, Aeroplanes and Airships

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One to Fifty Passengers

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In answering advertisements please mention this magazine.

COVE MACHINE REEFS WINGS.

George H. Cove, of Bridgeton, N. J., has a good looking biplane, with novel stability features, or "balancing wing tips." When one of these is opened out the other closes up, and vice versa. The part of the tip next to the main plane is braced and does not move. The outer part is hinged and worked either by the seat or by a lever. Opening the wing on one side of the machine increases the supporting surface on that side. Patents are now pending.

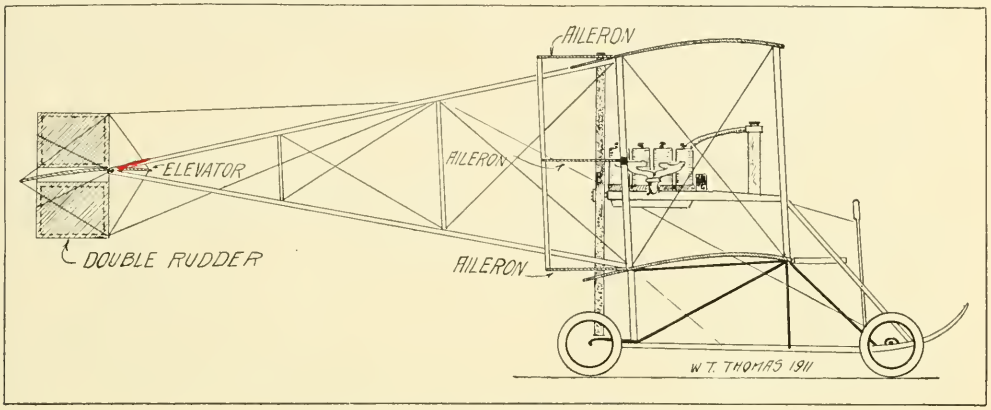
The power plant consists of an Elbridge 40-60 motor, twin El Arco radiators, and Gibson propeller. The weight of the machine is about 600 lbs. Steering right and left and up and down is accomplished by the wheel.

NEW MOISANT MONOPLANE.

The Moisant aviation school on Hempstead Plains, it is very probable, may be started going in April. Two brand new types of monoplanes are being worked out, a cross between a Demoiselle and the all-metal machine designed and built by the late John B. Moisant. This will be known as the "Baby Moisant." T. T. Lovelace is now associated with A. J. Moisant and the "Moisant International Aviators," as the correct title now is, as chief engineer. A plant has been put in operation in New York City.

R. W. STEWART BIPLANE.

The R. W. Stewart (Oakland, Cal.), biplane possesses several distinctive features from the ordinary biplane, being of the headless type.



Side View of the Thomas Machine.

The arrangement of the planes, the center section being advanced forward of the end sections, is claimed by the inventor to give a certain amount of automatic stability.

Voisin type vertical partitions will be placed between end struts. Curtiss type ailerons are operated by a control lever, which also operates elevator.

Spread, 35 feet, 6½ inches; chord, 6½ feet; camber, 4 inches; planes are double surfaced; total surface, 470 square feet; weight complete with aviator, 940 pounds; Farman type wheels will be attached to skids.

A double runner in the rear controls direction. The elevator is placed over rudder, while underneath is a stabilizing surface of same size. Power plant is placed in front. A 60 H. P. (claimed) of local manufacture, weighing 325 pounds, drives direct an 8 foot, diameter 4 feet, Paragon propeller.

No trials have as yet been made.

Cove Biplane Showing Balancing Feature.

WRIGHT PUPIL FLIES HOUR.

W. Starling Burgess, of the Burgess Co. & Curtis, Marblehead, Mass., made his first hour flight at the Wright camp, Augusta, Ga., on February 7, handling the machine entirely himself.

FIRST WAR FLIGHT.

On February 10 and 12, Charles K. Hamilton, of the Moisant International Aviators, giving exhibitions at El Paso, Tex., flew across the Rio Grande River at Juarez, Mexico, which is now in a more or less stage of siege by the rebel army in the opera bouffe war now being conducted on the Mexican border.

Threats to fire on aviators reconnoitering over Juarez were received by Mexican officers. Permission was obtained from Pascual Orozsco, the insurrecto leader, for aviators to reconnoiter over his camp, subject only to the danger that his own men might think the aeroplanes were from Mexican government forces at Juarez. Garros also flew over the Rio Grande River in his American Bleriot, built for the late John B. Moisant. Hamilton used his new Gnome engine in the flight.

The story to the effect that Lieut. B. D. Foulois, of the U. S. Signal Corps, has received orders to proceed to San Antonio with the Wright aeroplane offered by Robt. J. Collier to the War Department and accepted by the same, seems to be without foundation in fact. Collier recently obtained delivery of the new Wright biplane, the first Wright machine sold in this country to an individual for pleasure use, and offered the use of it to the Government in case it should care to employ it in experiments during the present Mexican disturbance.

HARKNESS FLIES NEARLY AN HOUR.

Harry S. Harkness, who took his two Antoinette machines to California this winter, flew on February 7 from the Curtiss aviation camp on North Island, opposite Fort Rosecrans, at San Diego, Calif., to the encampment of the U. S. troops on the Mexican border, near Tialfuana, a distance of 21 miles from Fort Rosecrans, carrying a message from Major McManus, commanding Fort Rosecrans, to his subordinate, Lieut. Rublin. The flight was eminently successful, Harkness being in the air 56 minutes. The message was delivered to the officer 25 minutes after receipt by Harkness.

This is the first real flight made by Harkness in this country. When he first came to Mineola, a few short flights were made. At the Belmont meet his machine was only outside of its shed once and then no flight was attempted.

STEVENS FLIES BLERIOT.

A. Leo Stevens made his first flight alone on February 13, but it was not on a Friday. It was in the Bleriot XI (Clement-Bavard motor), which was brought to this country last fall by Greely S. Curtis, of the Burgess Co. & Curtis. The machine had been previously flown once by Garros while he was at the Belmont meet. No other flights have been made in it until the above, which was at the Mineola field. It has been taken to Boston by S. A. Reid, who is said to have acquired the monoplane. Mr. Stevens has left for Boston and will no doubt try the machine out again while there.

The Elbridge Company's Brochure.

It is not until after reading "American Amateur Aviation," a twenty-page booklet distributed by the Elbridge Engine Company, that one realizes how prominent a part these engines have played in the development of American novices during the past year. While the booklet mentions many men who have made flights with other power plants, it still furnishes plenty of evidence that most novice events and records were made last year with the "Featherweight" output. Of course, if this were not the case, it is unlikely that the company would have spent the time and money required to publish the record, but no matter what the motive of its production, the little book contains a great deal of interesting matter well worth preserving.

Nearly half the space is given up to illustrations, some of them very good ones. William Evans is shown in flight over the city of Kendale, Kans.; B. F. Roehrig, starting for the novice altitude record at Los Angeles, Cal., where he flew three times as high as any of the amateurs at the later meet in San Francisco; C. F. Walsh, winner of all prizes at the October meet in Los Angeles; Glenn L. Martin, only California prize winner at the Los Angeles meet in December. Of the Eastern men developed during 1910 there are pictures of J. J. Frisbie, now with the International Aviators, and of Charles Morok, who, after three days of practice, safely flew over Newark, N. J. A photographic reproduction records the first flight of a single-propeller machine at Denver, Colo., which performance came too late for record in type matter.

Mention is made of the first successful flights in each section of the country—in each individual State and city wherever possible. Many unusual types of machines are shown, some of which never have flown, and others, such as the machines of M. B. Sellers and D. H. Gordon, which have flown with less than 10 h. p.

Almost every machine mentioned is a distinctly local product, made by the man who also taught himself to fly it. Most of the men whose names and whose records are contained in it will preserve "American Amateur Aviation" as a cherished possession. Sketchy as it is, it is the first attempt to publish in collected form the results of the first popular fever for aviation.

SPECIAL OFFER WARNING!!!

SECOND NOTICE

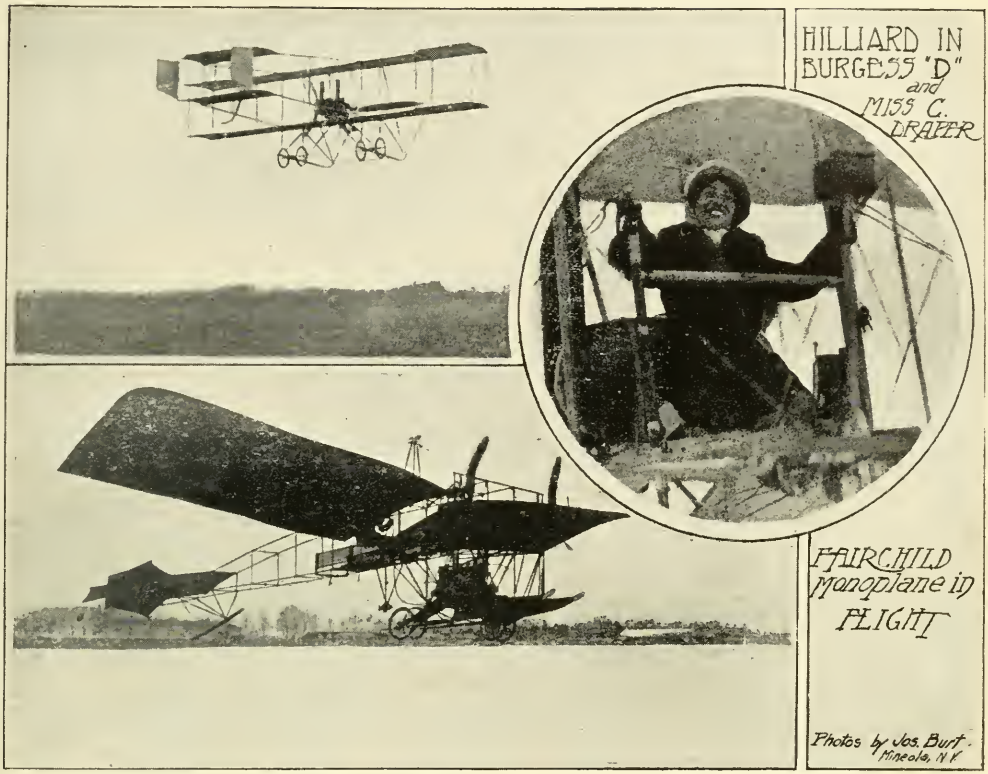
In order to reduce the strain on the bookkeeping department of "Aeronautics" and to secure an increase in the monthly bundle of good stuff, this extraordinary offer is made:

For *Ten Dollars* in coin of the realm, we will enter your subscription to the One and Only Real Aeronautical Magazine in America for life, or as much longer as may be desired.

Do not delay! This is a chance of a lifetime—there's no telling how long you may live. Open to present subscribers as well as non-subscribers. Just enclose your check, money order, or ten-dollar note in an envelope, with your name and address, and you will be enrolled at once in the Great and Honorable Scroll.

AERONAUTICS 250 West 54th Street, New York

WINTER FLYING AT MINEOLA



FAIRCHILD MONOPLANE WRECKED.

THE all-steel monoplane of W. L. Fairchild, which is the only one of its kind in all the world, was unfortunately wrecked on February 11 while making a turn, with Frank Schumacher pilot. The machine had left the ground and was turning in a fresh wind. One wing seemed to turn suddenly to a vertical position.

The monoplane designed by W. L. Fairchild was built last summer at Mineola, and a month ago made its first flights. It is unique by reason of its employment of two chain-driven propellers at the forward edge of the main planes, which are set at a slight dihedral angle. This angle had been frequently adjusted, as well as the angle of incidence. The changing of the former seemed to have a very direct effect on the speed of the machine.

Very good stability was one marked feature, laid by Mr. Fairchild at the door of the low center of gravity. The entire framework is of steel, in the use of which Mr. Fairchild claims great advantages. In practicing over the frozen fields no breakages have occurred, save a bolt in the spring shock absorbers.

The 6-cylinder, 100-125-h. p., 2-cycle Emerson engine drives in opposite directions by Diamond chains through tubes two big Gibson propellers.

During the past two months the machine has been out every day that the wind permitted, and even on the days of flying, the wind was quite strong.

The Burgess machine met with a mishap the same day while Hilliard was flying, the chassis giving way at a bad place in the grounds.

A double set of controls will be fitted for Miss Draper to use in her flying lessons.

The Payne Curtiss-copy has been out making its trials.

It is possible that both the Aeronautical Society and the Aero Club of America will abandon present quarters and move their sheds to a location further to the east, as the improvements of the local land company are beginning to interfere.

In this issue will be found the first published photograph of the Walden-Dyott monoplane in flight. It is a bona fide picture, however poor.

HILLIARD FLYING AT MINEOLA.

William Hilliard, who took the Burgess-Curtis Model D to Mineola after the Palace Show, has been doing fine flying every day the wind permitted, except for a couple of accidents to his Indian motor, when the crank case was blown out by a backfire and one cylinder cracked. These were fixed promptly, as the factory expressed parts at once. Several passengers have been carried, among them Miss Catherine Draper and A. Leo Stevens.

On Feb. 7 Mr. Hilliard took up at one time as passengers Miss Catherine Draper, of 42 West Sixty-eighth street, New York, and A. Leo Stevens. On the same day Mr. Hilliard took up his mechanic, Frank Lawson, and his baby. This was with heavy snow on the ground.

Mr. Hilliard is desirous of getting his pilot license before he takes the machine to the Boston Show.

The Wright Company has licensed the Burgess Company & Curtis, of Marblehead, Mass., to build aeroplanes under the Wright patents for sporting purposes only. The purchaser using this machine for exhibition work, like those who use Wright machines for like purpose, can secure a license for the use of the machine as a means of profit from the Wright Company.

This defines the policy of the Wright Company as not endeavoring to restrict the manufacture or use of aeroplanes, but rather the encouragement of their manufacture under a fair recognition of the patents.

W. Starling Burgess and a friend have been at Augusta, Ga., the Wright training camp, learning to fly. The training is done at the risk of the Wright Company, which assumes all breakage, and the pupil can take as many lessons as he likes.

The Burgess Company & Curtis is the first company in this country licensed to build under the Wright patents. This special privilege is due, according to Wilbur Wright, to the excellence of Burgess-Curtis construction and the reputation of Mr. Burgess in the yacht industry.

Pupils will now be accepted by the Burgess Company for instruction in flying as soon as the field at Squantum, Mass., is put in proper order for the purpose. Indications promise a very busy season both for instruction and building aeroplanes.

Upward of 100 Wright biplanes are listed as put out by the Wright Company, or licensed foreign concerns, in Fred T. Jane's "Flying Annual."

Thirty-seven owners of Curtiss machines are given, among which one notes with interest the names of C. F. Bishop, Col. E. H. R. Green, Clifford B. Harmon and J. H. McAlman. A. C. Triaca, more or less known to fame, has no less than four. How sad this all is—and to think that the unfortunate Triaca has yet to have his first aeroplane ride!

FARWELL GETS RADICAL PROPELLER RESULTS.

F. O. Farwell, of the Adams-Farwell Company, has been conducting a series of experiments of some months' duration, testing the comparative efficiency of single high-speed propellers of various shapes, pitches and diameters; two propellers at slower speed side by side, Wright fashion; and two propellers on same axis run in opposite direction.

An electric motor was used and the power in current consumption was accurately tabulated. The propellers were journaled at the end of a long arm or whirling table similar to that used by Langley and Maxim. The thrust, propeller speed, power consumption, were taken with the propellers held stationary, then the arm was allowed to whirl and speed and pull were taken.

These experiments, together with numerous photographs, will be put in shape for publication in the near future.

Mr. Farwell only hoped the arrangement of two propellers on the same axis would approximate in efficiency the two propellers side by side. "The tests proved the new arrangement more efficient than the side by side arrangement, not taking into consideration the transmission losses of this system, and as the new system has no more transmission loss than the single direct-connected propeller, the efficiency is greatly in favor of the new system.

"This efficiency was not what was expected or sought after, however. Our association with revolving cylinder motor for twelve years has shown us the limitations of this type of motor with stationary crank shaft very clearly. At moderate cylinder revolution speed, it is unquestionably the most efficient and best cooled motor in existence.

"We are building a much larger motor, embodying several novel features which we are not quite ready to make public in detail. This motor will retain the revolving cylinder air cooled features which we originated and have used in automobiles since 1898.

"The greatest departure from revolving cylinder motor practice which has now ceased to be considered freakish is the feature of revolving the crank shaft as well as the cylinder, in the opposite direction, of course.

"In use in air crafts and motor boats, one propeller will be connected direct to the sleeve extending from the revolving cylinders, and another propeller will be connected direct to the crank shaft and revolve in the opposite direction.

"The cylinders will revolve at about 800 r. p. m. and will drive a 9-ft. 6-in. to 10-ft. direct-connected propeller. The crank shaft will revolve in the opposite direction at about 1,000 r. p. m. and will drive a 7-ft. 6-in. to 8-ft. direct-connected propeller. The piston speed will be equivalent to that of an ordinary motor at 1,800 r. p. m. A 36 and 30-in. propeller will be used in motor boats.

"The turning torque is completely absorbed by the oppositely revolving propellers. As no turning torque is communicated to the craft, it may be made lighter and the ill effect of this reacting torque on light crafts having large power and large propellers is entirely eliminated. The power of this new motor will be considerable above 100 h.p.

"The ignition system, three independent means, valve mechanism and fuel injection system (no carburetor is used) are subjects of pending patents and will be described in detail at the proper time. A motor embodying all these new features has been in operation and under test for several months. There will be no motors offered for sale for some time."

Walden-Dyott Monoplane in Flight.

Please allow me to express my appreciation of your valuable paper, every issue of which I carefully read from cover to cover. I have in more than one instance found single articles worth to me many times the amount of a year's subscription.

—E. J. DIXON.

Detroit Aeroplane Co.

DETROIT, MICH.

ANNOUNCES

Beginning March 1, 1911, the DETROIT-AERO 20—30 H. P. ENGINE will only be sold as complete power plant ready to run **Price, $350.00** consisting of

1 DETROIT AERO ENGINE
1 CARBURETOR
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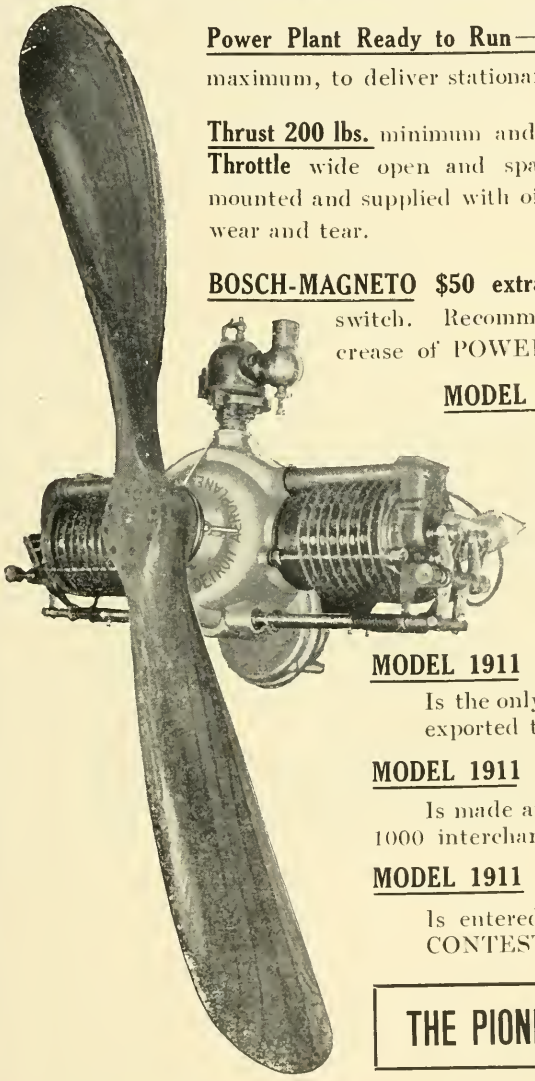
1 TIMER
4 SPARK PLUGS
4 MOUNTING BOLTS
1 SWITCH
PRIMARY AND SECONDARY CABLE
1 OIL TANK with connections



Power Plant Ready to Run—Guaranteed to Weigh 150 Lbs. maximum, to deliver stationary

Thrust 200 lbs. minimum and to run any length of time with **Throttle** wide open and spark fully advanced, if properly mounted and supplied with oil and fuel, showing only natural wear and tear.

BOSCH-MAGNETO $50 extra, including cable, ground-wire switch. Recommended by us for safety and increase of POWER.

MODEL 1911

Has been tested for 11 hours continuous run under full propeller load.

MODEL 1911

Delivers on the average 200 LBS. THRUST.

MODEL 1911

Is the only American made air-cooled engine exported to FRANCE.

MODEL 1911

Is made at our own plant in DETROIT in 1000 interchangeable duplicates.

MODEL 1911

Is entered in the A. C. A. 1911 MOTOR CONTEST.

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The aeroplane that has proven itself to be safe, practical and always ready. The only machine built to accommodate two people comfortably. Holder of the World's Record for Slow Flying, Quick Turn and Accuracy of Landing; and American Record for Long Distance Cross Country Flights, Duration, Distance and Altitude.

At the recent Harvard-Boston Meet at Atlantic, the Wright Flyer, in competition with Bleriot, Farman, Curtiss and other machines, took first prize in duration, distance, altitude, accuracy of landing, slow flight and the Hammond Cup for bomb throwing.

Planes, propellers and motors built entirely in our own factory. Write us for terms and delivery date.

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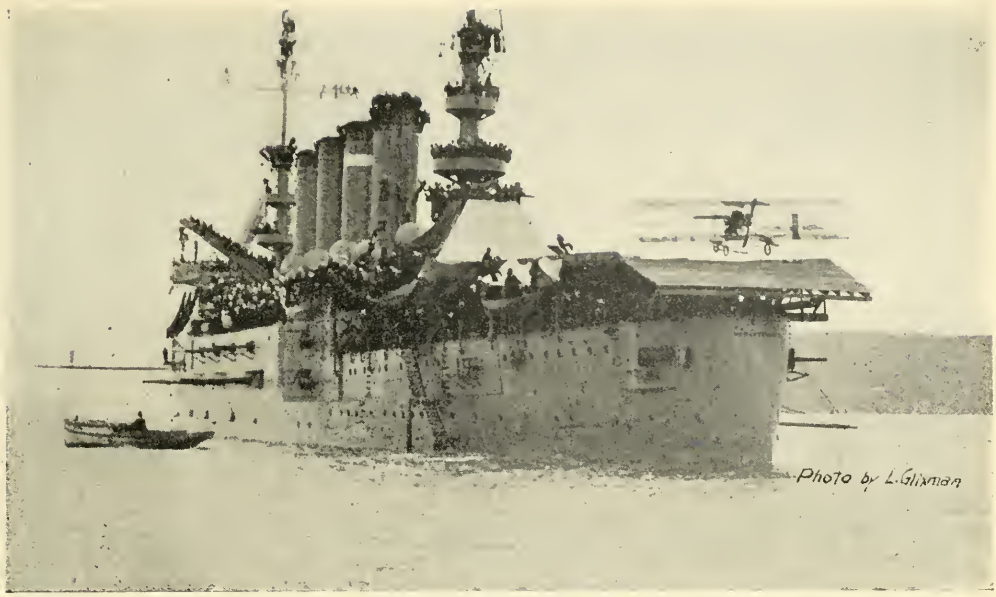
This pieture shows part of the factory of the Greene Company, Rochester, N. Y., and some of the

3-inch Palmer Tires used on the Greene Aeroplanes.

Manufactured by **THE B. F. GOODRICH COMPANY**
AKRON, OHIO



Ely Landing on the Battleship.

SAN FRANCISCO MEET

By Cleve T. Shaffer

SELFRIDGE FIELD, San Francisco, so named by the Board of Judges in honor of Lieut. Selfridge, the first army officer to be killed in an aeroplane accident, was the scene of considerable aerial activity from Jan. 7 to 25, inclusive, it being the first glimpse of flying the San Francisco populace had seen since Paulhan made several short flights last year. Radley, Brookins, Latham, Parmalee, Willard and Latham participated in the ten days of actual flying. Ely

The second day was the banner day in attendance, it being estimated that over 100,000 people were present, and considering the poor flights made on that day it is a credit to San Francisco's interest in aeronautics that the attendance was good the rest of the meet.

Aside from the military aspect given by Ely's flight to the cruiser and return, the participation of United States troops in various manoeuvres, the meet was, with the exception of cross-country flights by Latham and Radley, and Parmalee's new American duration record, a number of short exhibition flights, the contest element still being missing. The flights were, with the above exceptions, unspectacular, due to several causes.

No doubt the recent death of Hoxey had its psychological effect upon the aviators and tempered their usual performances. Then, too, the exceeding parsimony shown, among other things, in the construction of the flimsy "shelters," with open sides and ends, and roof of light canvas or sheeting, which allowed the rain to saturate the machines, ruining their finish and making them unsafe, had its effect also on the aviators.

Much fault was also found with the field selected. The course, laid off in a 2½ kilometer oval, was very bad, in fact was claimed by the aviators to be the worst they had ever flown over. Several deep gullies which transversed the grounds were popularly and appropriately named, "Calamity Gulch" being one that did not belie its name. "Radley's Bog" claimed several, while one of the fences which bisected the lower field and had been unaccountably left standing, put an end to Latham's machine after a wreck in almost the same place the day before. Two or three small lakes added to the interest, one unfortunate novice landing in cold water up to his waist. When such premier aviators as Latham, Radley and Ely came to grief it is certainly not strange that most of the novices met with disaster.

With Latham disposed of, Ely was easily the star, his remarkable flight to the cruiser being the event of the meet. Parmalee's breaking of the American endurance record and the entry of Latham through the Golden Gate were the other prominent features.

Inclement weather after the first few days was rsponsible for some postponements.

The grandstand and hangars were placed at right angles to each other at one end of the field, the announcing board being placed opposite and forming the end pylon around which the circuit was made. Events were not run off in accordance with the programme. In fact, flying was done whenever machines were ready and aviators so minded. Therefore, no daily record will be given.

No attempt was made for altitude, though the barographs were hung on the machines several times. There was a noticeable absence of the celebrated Wright "spiral; Brookins did it but once. Another missing Wright feature was the "Baby Wright," which was on exhibition in the hangar but did not go out more than once.

Military uniforms were very much in evidence, the second battalion of the 30th Infantry being encamped on the field. Results gained, viewed from a military standpoint, while more or less instructive to the officers and men, were of small actual value and proved but little that had not been done before, despite the newspaper gush, excepting, of course, Ely's flight to the cruiser and some wireless telegraphy while in flight.

FEATURES SAN FRANCISCO MEET.

P. O. Parmalee (Wright) makes new American endurance record—3 h., 39 m., 49½s.

Eugene Ely (Curtiss) lands on deck of battleship and departs again.

Wireless tests.

PRIZES WON BY AMATEUR AVIATORS AT SELFRIDGE.

H. A. Robinson, in standard Curtiss machine, $1,333.33.

Fred. J. Wiseman, in original biplane, $1,283.33.

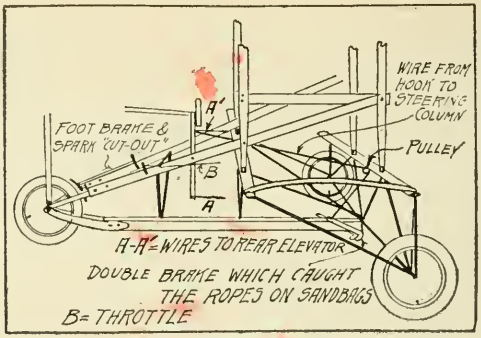
Lincoln Beachey, in standard Curtiss machine, $858.33.

Clarence H. Walker, in standard Curtiss machine, $250.

THE USE OF WIRELESS.

The wireless set weighed 32 pounds. It consisted of a small spark-gap and interrupter, an ordinary telegraph key, a small storage cell and a shunt to prevent overcharging the coil. All of these were combined in a box which was carried by Lieut. Paul Beck upon his lap. For an aerial 120 feet of stranded phosphor-bronze wire was used, pendant from the tail of Parmalee's Wright aeroplane and connected with the sending apparatus by a No. 16 copper insulated wire. For inductive ground the other side of the sending apparatus was connected to the guy wires. The wave length measured by the wave meter of the receiving station was 525 meters in length.

Willard also had a small set installed, and in one test he received successfully, while in flight, instructions to turn and land.



How Ely Was Stopped by the Sand Bags.

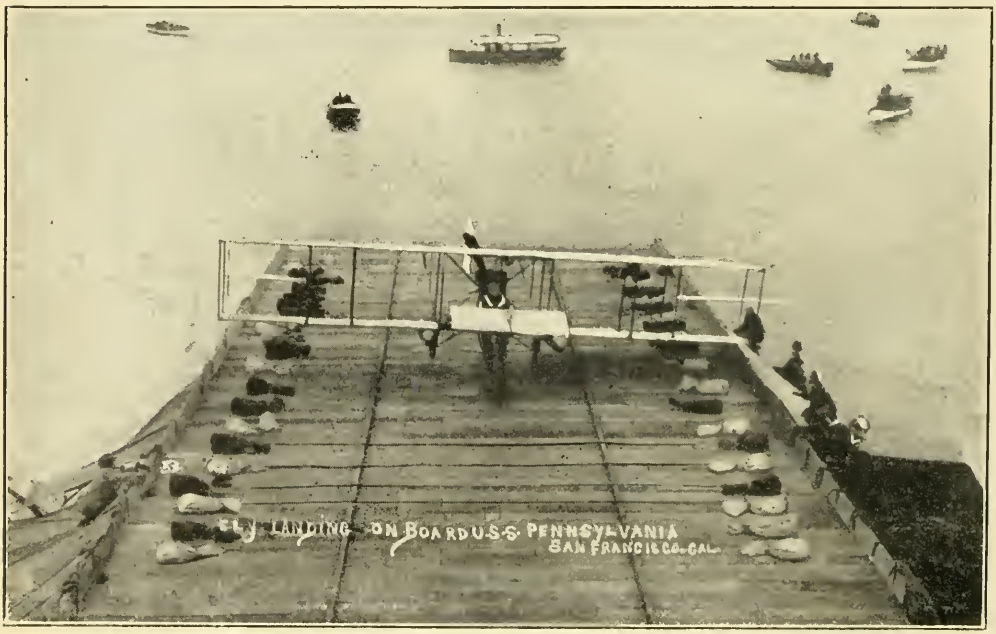
BOMB DROPPING TESTS.

The bomb dropping experiments were productive of no really important information, except to arouse the public to its possibilities, tests being made at altitudes where ground fire would annihilate the aviators.

Two classes of bombs were used (both the invention of Lieut. M. S. Crissy), one a percussion shell which explodes on contact with the ground, and one which can be timed to explode at any height. The former consisted of a pear shaped iron casting filled with a light charge of black powder and shrapnel bullets, an ordinary .38 caliber blank cartridge setting off the charge. The latter shell had a combination of time and percussion fuse, the construction of which was not explained, his intention being to offer it to the War Department.

LARGE NUMBER OF NOVICES.

The large entry of novices was one of the features of the meet. Twenty in all were entered and nine of them flew, that is, across "Calamity Gulch" at last. This ravine, a little past the starting line, had sufficient slope



Ely Landing on the Pennsylvania—Note the Sand Bags to Aid in Stopping Machine.

A Great Opportunity for Investors

The manufacture and exhibition of aeroplanes is now the most profitable of industries. It has reached a considerable development in France, but is in its infancy in this country. Those who are enterprising enough to

Get In On The Ground Floor

will reap equally as profitable a reward as the pioneers of the automobile industry.

The United States Government has appropriated **One Hundred and Twenty-Five Thousand Dollars for Aeroplanes,** and will advertise for bids for twelve aeroplanes for the Signal Corps.

$650,000 Has Been Offered in Prizes for Flights, Contests, and Improvements

It is impossible to supply the demand at the present time for aeroplanes for public exhibitions. Every day brings some new development and new records in aerial navigation, insuring safety, speed, and rendering aeroplanes as much a commercial product as the automobile, with the advantage that they can be manufactured more cheaply.

The Rex Smith Aeroplane Company controls all the patents and the rights to manufacture and exhibit the **Rex Smith Aeroplane.** This company has purchased a tract of land at College Park, the home of the aeroplane, and has in course of construction, a plant with every possible facility for the construction of aeroplanes. The company proposes to sell a small amount of stock for a limited period, at one-half par value, after which, no shares will be obtainable.

The Rex Smith Aeroplane has made more successful flights, without any accidents whatever, and has shown more strength and inherent stability than any machine heretofore produced.

This company owns valuable patents covering inherent stability, hydroplanes, automatic equilibrium, and control.

Write To-Day For Particulars

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The Aluminum **Smalley-Aero**

With its great power and never failing reliability makes it the motor "Par Excellence" for aviation.

The great fame of our "SMALLEY" Marine Motors for winning more races, each season, than any other motor, will be exceeded by the power, performance, and satisfaction given aviators by our "SMALLEY-AERO."

It is a motor that can be depended on to stay up and keep going as long as the fuel lasts.

Two cycle; 4½" bore and stroke; 2, 3, 4, or 6 cylindered.

Made completely of Aluminum. Our own exclusively devised Aluminum Cylinders with Cast Iron liners where pistons travel. (Patent applied for.)

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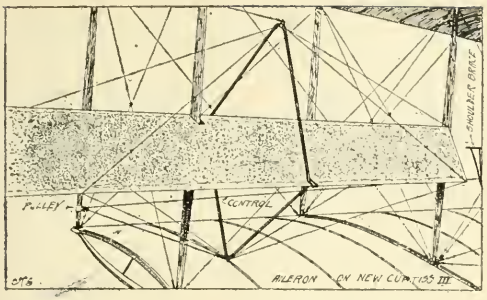
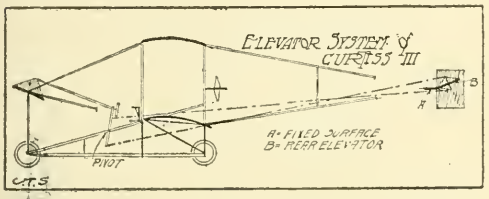


to get most of the machines off the ground, in the majority of cases to be completely wrecked coming to earth on the opposite side.

The "novice" class comprised really truly novices, near novices, and alleged professionals. The latter were allowed to compete over the protest of the Pacific Aero Club and genuine novices, despite the fact, it is claimed, that their professionalism is a matter of public knowledge and record. It is rumored that the high handed action of those in charge, as representatives of the National Council, will have its effect at the council's next meeting. The sanction for the meet was secured by the Pacific Aero Club. The members, however, received but scant consideration, being denied any privileges.



Fred Wiseman (Wiseman biplane with Hall-Scott motor), and Clarence Walker (Curtiss), were the novice stars. Wiseman made several very good flights, his turns being taken without trouble. Wiseman was the star of the novice class, though Robinson stands first in the list of prize winners. Robinson was trained for professional work at the Curtiss camp at San Diego before being entered in the novice class at San Francisco. Wiseman built his own machine last year and has had to dig out all his information for himself. A complete description of the Wiseman machine appeared in the September, 1910, number. Walker with a brand new machine was a clever beginner and promises to be a brilliant flyer.

T. S. Kerns (Elbridge engine and Gibson propeller) of Chico, Cal., in a Curtiss-type machine, of crude construction, flew across "Calamity Gulch" several times, the last time wrecking the machine beyond repair.

Giselman, in a composite type machine, flew across several times also, with the same result upon landing.

George H. Loose piloted the Farman type machine of Sheaf & De Berrie within a few feet of the half mile line, when the crowd upon the unpoliced course caused him to swerve and strike a bank, the result being as usual. When the crowd had left a microscope was needed to find what remained of the machine. Mr. Loose had a narrow escape, as the heavy engine crashed down upon the seat from which he had been thrown out.

Lincoln Beachy (Curtiss), and Robinson (Curtiss), with their experience naturally flew very well.

Rex Young (Curtiss-type), in making his initial attempt, lost his lateral equilibrium and came down on one end with slight damage.

Louis Fortney, in a large Antoinette-type machine, got over the first gulch twice. On his second flight he crashed into the side fence with results the same as that of the other novices.

O. Meyerhoffer in his triplane got off the ground for a short distance.

W. C. Wheeler (Bleriot-type), and the Brewer Bros. (composite), were under-powered and unable to rise. With sufficient power both should be successful.

C. E. Lambruth, with a multiplane, popularly known as the "Cathedral," ran about over the ground.

ELY LANDS ON WARSHIP.

On January 18 Ely, for the first time in the history of aviation, landed his aeroplane on the deck of a vessel. He left the field in his new Curtiss III at 10:45 a. m. and at 11:01 landed on an inclined platform erected on the stern of a cruiser anchored in San Francisco Bay. Sand bags were at either ends of a series of ropes placed one after the other on the platform. Two wooden rails extended longitudinally, which raised the ropes several inches above the boards. On each side of the platform were tarpaulins, with sailors spread about, to catch the aviator in case he fell or missed the platform.

As the machine struck, the hooks usually employed for digging in the ground to stop the aeroplane (when the elevator is pushed far forword, as shown in the photograph), caught up these ropes and the weight of the sand bags quickly retarded the speed of the machine. The illustration shows the machine at the moment of landing, before the hooks started their work.

Three-quarters of an hour later, the machine having been turned around, Ely left the war vessel and returned to the field, where he was given an ovation.

NEW ENDURANCE RECORD PRODUCED.

San Francisco's aviation meet produced a new American endurance record on January 22, when Philip O. Parmalee, piloting a Wright biplane, remained aloft for 3 hours, 39 minutes and 49 1-5 seconds.

At Los Angeles Arch Hoxsey, who later was killed, was credited with a record of 3 hours, 16 minutes, 50 seconds.

"I could have remained up longer," said Parmalee, "but my seat grew so hard and my hands and feet so numbed with the cold that I decided to come down after clinching the American record."

The long flight was uneventful.

AERO CALENDAR FOR THE U. S.

Feb. 11-13—Salt Lake City, Utah, Curtiss aviators and novices.

———— —Baton Rouge, La.

Feb. 9-13—El Paso, Tex., International Aviators.

Feb. 18-26—Tampa, Fla., Curtiss aviators (Beachey and Ward).

Feb. 20-25—Boston, Mass., 2d annual show.

Oct. 5—International Balloon Race. Place to be named later.

March 6-11—Aeroplane flights looked for at San Bernardino, Cal.

A St. Louis lawmaker has introduced a bill in the State Legislature prohibiting aeroplane ascents to a height exceeding 1,000 feet, and aviators are required to file a $10,000 bond that they observe the law. Penalty is a 5-year prison sentence and failing to file the bond the crime is classed as attempted suicide.

This progressive solon must think that a fall of 1,000 feet is not necessarily an inconvenience. It is hoped that this foolish bill will meet its just reward.

The town of Modesto, Calif., has inserted a clause in its charter providing for erection and maintenance of municipal aeroplane landings when needed.

THE SAN DIEGO MEET.

SAN DIEGO, Cal., Jan. 27-28.—On the day scheduled for the first meet to be held by the Aero Club of San Diego, Jan. 27-28, 1911, the weather was threatening. It rained all of Friday night and continued to rain until about 1 o'clock Saturday. At this time the rain ceased, although the sky remained cloudy. Those conducting the meet decided to have it rain or shine, and promptly at 2 o'clock Curtiss was seen approaching from North Island, at a height of about 200 feet. He followed the beach line to the end of the island, crossed the channel between that and Coronado Island, and entered the field at its southern end. After circling a few times, he alighted gracefully on the sod in front of the grand stand. He was rapidly followed by Ely and Robinson, his two aviators.

On account of the unsettled weather the crowds were small, but enthusiastic and appreciative. The flight made by Curtiss and his aviators developed features new to these machines in Southern California. Curtiss had earned the title of cautious because of his carefulness, but at this meet he showed that the Curtiss machine was certainly capable of all of the air gymnastics that the Wright machines had been executing.

Ely especially developed a desire to out-do Brookins or Hoxey in the ocean wave and the spiral dip. The exhibitions given here were certainly a credit to the Curtiss flyers. A race was arranged between Robinson and Ely, which aroused great enthusiasm amongst the spectators. They left the grounds together and circled the course several times with Ely above and Robinson below. At 4 o'clock the machines left for North Island, and after another hour the crowds dispersed.

Sunday, the second day of the meet, was fine. Not a breath of air stirred the whole day. A large crowd of people, numbering probably ten thousand, gathered at the Country Club grounds to see the flying. The flights of Saturday were repeated, and both Ely and Curtiss did some skillful manoeuvring, showing that the Curtiss machine could be handled with certainty. The turns were made abruptly and at a steep angle, and on one occasion Curtiss out-did Ely in the execution of air stunts by chasing a toy balloon, turning first one way and then another, then upward and then downward, with ease and quickness in order to catch the balloon.

An interesting feature of the meet in the afternoon was an attempt to fly made by Lieut. Ellyson of the United States Navy. He was attending the meet at the instance of the government of the United States, Curtiss having agreed to teach a naval officer and an army officer to fly. Lieut. Ellyson drove the machine straight down the field without leaving the ground. He then turned the machine toward the starting point and started back. About a third of the distance from the start he left the ground abruptly and rose to a height of twenty-five feet. His machine swayed from side to side, and darted toward the ground, and as he neared it one side tilted to a sharp angle and struck on one corner, smashing the ribs on that end, but otherwise not damaging the machine. After that the machine ran forward on its wheels and came to a stop without further damage.

This was Ellyson's first flight, and the young lieutenant kept his head and controlled his machine in such a way as to demonstrate the fact that a little practice would make him a skilled aviator.

This meet certainly showed that rain storms are more favorable to flying than dry, hot weather. The wind is even and more steady, and flying less dangerous. The San Diego meet was a success, scientifically, financially and practically, and demonstrated the suitability of this locality for meets of this kind.

H. LA V. TWINING.

FORT WORTH FLIGHTS.

FORT WORTH, Tex., Jan. 12-13.—January 12, the opening day of the meet of the International Aviators, was characterized by a high southerly wind, varying from twenty to thirty-five miles per hour. At 1 p. m. Frisble had his man-lifting kites flying over the field, and the aviators and one or two of the spectators allowed themselves to be carried a hundred or more feet off the ground. Fully seventeen thousand people witnessed this exhibition, and when later in the afternoon some signs of impatience were manifest, Roland Garros, despite the remonstrances of Simon and Barrier, climbed into his 50-H. P. Bleriot and was off. When about two hundred feet in the air and directly above the grand stand, a sudden puff of wind caught his machine and a quaver of the wings showed the danger of his position. With the same ease and skill displayed in all his work, however, he righted himself and made a spectacular flight to the north, over North Fort Worth, thence east and south in return to the aviation field. Great fears for his safety were entertained when he attempted to land in the face of the wind, but again he showed his superior mastery. This was the only flight of the day, Audemars having given up all attempts to fly the "Demoiselle."

It was well after 5 o'clock of the second, another windy day, when Rene Simon pointed the nose of his machine toward the clouds and followed very much the same course as Garros on the preceding day. Audemars showed great skill with his little "Demoiselle," although the wind overturned the machine when he made his last flight. The machine was slightly damaged, but the aviator was uninjured.

It was to be regretted that the wind interfered so seriously with the flights of the aviators, but the general feeling was one of satisfaction, and the men who are thus furthering the science of aviation stand high in the estimation of the citizens of Fort Worth.

HOMER H. MARTIN.

HAVANA MEET.

Havana, Cuba, Jan. 29-Feb 5.—At the Havana meet of the Curtiss aviators, McCurdy, Beachey, Ward and Russell made a good exhibition of flights, often in strong winds. On the closing day, J. A. D. McCurdy flew from Camp Columbia, over sea and land, to Morro Castle and back, a distance of about 16 miles, thereby winning the $3,000 prize. He circled Morro Castle twice. In the evening the newspapers entertained the aviators and presented each one with a cup. President Gomez was at a luncheon given in honor of the aviators, and $6,000 was subscribed for the encouragement of aviation in Cuba.

Beachey flew the Albany-New York machine, and Ward flew his new 8-cylinder machine for the first time.

FOUR TYPES OF CURTISS MACHINES.

There are now four types of Curtiss machines. One is known as the "Rheims racer" type (I) and is sold with either four or eight-cylinder engines. As will be remembered, this is a duplicate of the first machine which was purchased by the Aeronautical Society. The second edition of the Curtiss type, known as the "Belmont," is the same as the previous one in essential details. The planes are, however, double covered, and there are minor changes in the engine bed. The planes are in sections and each section is interchangeable. This is the Curtiss II. This is true also of all the later types. The new Curtiss III. machine, flown first at Los Angeles, was developed at the San Diego winter experimental grounds. A full description of this new type is given elsewhere in this issue. The fourth model, designed for passenger carrying and military work, is about the size of the large Curtiss machine built by Willard last summer, of which full details and drawings were published in the September number of AERONAUTICS, with the exception that the alterations adopted for the No. III. machine are also carried out in the No. IV.

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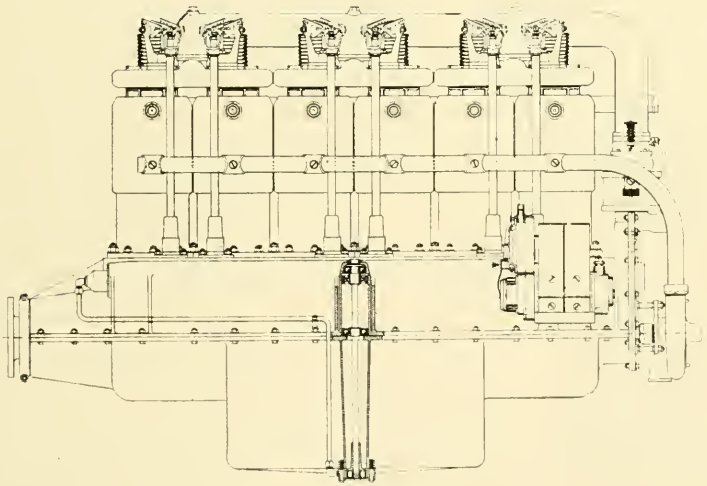

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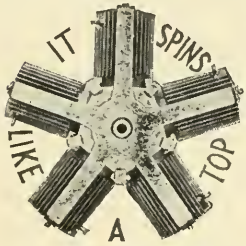

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Stock Sizes **Prompt Deliveries**

16 x 1½ in. Monoplane Tail Wheel. Weight 3 lbs.
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¶ All parts are furnished, with simple instructions and plans for every model.

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San Antonio, Tex., Feb. 2-6.—Moisant International Aviators. Hamilton flew in old-time form. Owing to the nearness of Fort Sam Houston, a military aspect was given the show. The details of the experiments will be found elsewhere in this issue.

TRINIDAD, Colo., Jan. 22-23.—The Mathewson machine (with Elbridge engine and Gibson propeller) succeeded in flying short distances after a half day was lost in preparation. The high altitude of Trinidad (6,000 feet), made flying difficult.

KEY WEST, Fla., Jan. 28-30.—McCurdy flew gratuitously before trying the Havana flight.

SEATTLE, Wash., Feb. 4.—Willard and Ely made exhibition flights.

AEROPLANE RECONNAISSANCE

DURING the meet of the Moisant International Aviators in San Antonio, Feb. 2-6, some experiments were made by Brigadier-General Hoyt, in command of Fort Sam Houston, First Lieutenant B. D. Foulois being directly in charge.

Three problems were arranged, as follows:

PROBLEM I.

General Situation:

Hostile artillery is located on the high ground in vicinity of the Insane Asylum, south of Fair Grounds.

Required:

1. Exact location of guns.
2. Number of guns.
3. Supporting troops, if any.
4. Location of supporting troops.

* * *

This problem will be divided into two phases: (1) The artillery will take up a position, assimilating service conditions, and will endeavor to **conceal** its position from aerial reconnaissance. The aeroplane will be sent out to locate and report upon the location, number and disposition of guns and troops. In this phase of the problem there will be no firing, as it is simply desired to test the visual qualities of the pilots or observers. (2) Upon the return of the aeroplanes, the pilots or observers will render their reports. They will then be required to make a second reconnaissance to verify their reports.

Upon the second appearance of the aeroplanes the artillery will open fire with blank ammunition. There was an umpire for artillery, to report upon position of guns, use of artificial cover, methods of securing ranges, kind of fire employed, disposition of caissons.

A second umpire was appointed for aeroplanes, to note **altitude** of machines while making reconnaissance, methods of approaching enemy's position, qualifications of non-military observers for military scouting.

PROBLEM II.—ARTILLERY ATTACK.

General Situation:

Aeroplanes will be sent out from Fair Grounds until they have gained a sufficient distance (approximately 2 miles) and altitude (1,000 ft. or higher) to give the service field guns an opportunity to fire upin the machines.

The artillery will then enter the Fair Grounds enclosure at a gallop and go into action in front of the grand stand.

Umpire for Artillery:

To report upon methods of securing ranges; artificial means used to aid firing; kinds of fire employed.

Umpire for Aeroplanes:

To report upon altitudes of machines, with reference to safety; movements of machines after firing commences.

PROBLEM III.—AEROPLANE ATTACK.

General Situation:

The field pieces used in Problem No. 2 will be left in position and a normal danger zone will be drawn around them. Men and horses to be removed a safe distance. The aeroplanes will then be sent up, pilots or observers being armed with dummy bombs.

All aeroplanes must operate at an altitude of 1,000 ft. or more.

Umpires to report upon altitude, hits, etc.

Material to be **furnished** and **work** to be **done** by Aviation Committee.

50 bombs, plaster Paris,

5 canvas bags,

Bombs to be at least 3 in. in diameter and have a weight of 1 lb.

Each **bag** to be made of canvas, or other strong material, and large enough to carry 10 bombs.

In addition to the above material, it will be necessary to have several semi-circular mounds thrown up in the Fair Grounds enclosure for the use of the artillery in Problem No. 2.

Detailed information as to dimensions of mounds will be furnished later.

REMARKS.

In Problem No. 1, Simon and Garros, in Bleriot monoplanes, were sent out to solve the first phase of this problem. Simon maintained an altitude of approximately 500 ft. during the entire reconnaissance. His information was very accurate, but under active service conditions he would have been shot to pieces flying directly toward the field guns at such a low altitude.

Garros conducted his reconnaissance at an altitude of approximately 2,000 ft., and approached the enemy's position by the flank, which required very rapid changes in the position of the guns, and consequently gave the enemy very little opportunity for firing upon him. His information, however, was very inaccurate. He reported a small body of cavalry, and no guns.

The only troops taking part in the problem were three gun sections of field artillery. In the second phase of the problem Barrier was sent out to verify the reports of Simon and Garros. He conducted his reconnaissance at an altitude of approximately 600 ft., and approached the enemy's position by the left flank.

In less than one minute after he arose in the air the enemy's artillery opened fire, and continued to fire upon him during his entire reconnaissance. He passed so close to the guns that the concussion, during the firing, disturbed the equilibrium of his machine. He secured accurate data of the enemy's strength and dispositions, but he probably would have been put out of action, due to venturing so close to the enemy's guns.

PROBLEM NO. 2.

Simon and Garros were again employed in this problem. They were sent into the air, and as soon as they were clear of the aviation field a battery of artillery entered the field and opened fire on them.

Simon circled around the field at an altitude of approximately 500 ft., whereas Garros speedily climbed to an altitude of approximately 3,000 ft. Simon was ruled out of action, but Garros was considered to have gotten away safely.

PROBLEM No. 3.

Barrier was sent up to try his skill in this problem. A stiff breeze was blowing, which made it extremely difficult to control the monoplane and drop bombs at the same time. He only tried one shot at the target, at an altitude of approximately 300 ft., and missed the right end of the target by 75 ft.

These problems were worked out February 4, 1911. Lieut. E. St. J. Greble, Jr., 3d Field Artillery, commanded the artillery. Lieut. W. I. Holliday, 3d Field Artillery, was the umpire for artillery. Lieut. B. D. Foulois, Signal Corps, and Lieut. J. R. Lynch, 3d Field Artillery, were umpires for aeroplanes.

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CULVER ROAD, ROCHESTER, N. Y.

HOW TO BUILD A CURTISS-TYPE BIPLANE*

By G. H. Godley

The main beams offer no especial difficulties. They are ovals, 1¼ by 1⅝ inches, all 6 feet long except the eight end ones, which are 6 feet 2 inches. The beams of the central section should be of ash, or else should be thicker than the others. In the latter case they must be tapered at the ends so that the clamping sleeves will fit, and the additional wood must all be on the lower side so that the ribs will not be thrown out of alignment. The spruce used for the other beams should be reasonably clear and straight-grained, but a small knot or two does not matter provided it comes near the end of the beam. The beams may be cut to the oval shape by the saw-mill or planed down by hand.

"Fish-shaped" or "stream-line" section, as it is variously known, is used for the struts. It is questionable whether this makes any great difference in the wind resistance, but it seems to be the fashion. It is more important that the struts be larger in the middle than at the ends, as this strengthens them considerably. At their ends the struts have ferrules of thin 1-inch brass or steel tubing, and fit into the sockets which clamp the ribs and beams together. The material is spruce, but the four central struts which carry the engine bed should either be ash or else of larger size, say 1¼ by 3 inches.

CARE NECESSARY TO GET PLANES PARALLEL.

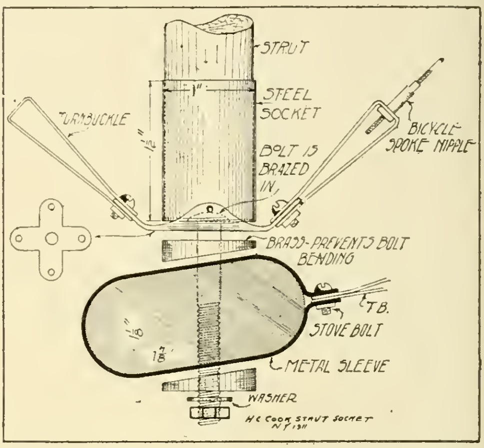
The front struts must be longer than the rear ones by the thickness of a main rib at the point where the rear strut bolt passes through it, less the thickness of the rib ferrule through which the bolt of the front strut must pass. However, the first distance is not really the actual thickness of the rib, but the distance between the top of the rear beam and the bottom of the strut socket. In the drawings the difference in length between the front and rear struts is given as 2 inches, but it would be better for the builder to leave the rear struts rather long and then measure the actual distance when assembling, making the struts to fit. The ends of the struts should also be countersunk enough to clear the head of the socket bolt.

One of the things which the builder cannot well escape buying outright are the strut sockets. These are cup-shaped affairs of pressed steel, which sell at 20 cents each. Thirty-two of them will be required for the main frame, and a dozen more can advantageously be used in the front and rear controls, although for this purpose they are not absolutely necessary. These can be had in a larger oval size suitable for the four central struts that carry the engine bed, as well as in the standard 1-inch size. The bolts which project through the bottoms of the sockets are ordinary ¼-inch stove bolts, with their heads brazed to the sockets.

For the rear struts, where the bolt must pass through the slanting main rib, it is advisable to make angle washers to put under the socket and also between the beam and the rib. These washers are made by sawing up a piece of heavy brass tubing, or a bar with a ¼-inch hole drilled into its center, the saw cuts being taken alternately at right angles and at 60 degrees to the axis of the tube.

The sleeves which clamp together the ends of the beams are made of sheet steel about 20 gauge. The steel is cut out on the pattern given in the drawing, and the 3/16-inch bolt holes drilled in the flanges. The flanges are bent over by clamping the sheet in a vise along the bending line, and then beating it down with a hammer. Then the sleeves can be bent into shape around a stray end of beam wood. The holes for the strut socket bolts should not be drilled until ready to assemble. Ordinarily 3/16-inch stove bolts will do to clamp the flanges together.

Having reached this stage, the builder must now supply himself with turnbuckles. As stated above, these may either be purchased or made by hand. It is possible to use either one or two turnbuckles on each wire. One is really sufficient, but two, one at each end, add but little weight and give greater leeway in making adjustments. As there are about



Strut Socket Attached to Lower Rear Beam. This System Is Employed by H. C. Cook, of New York, in His Curtiss-Type Biplane.

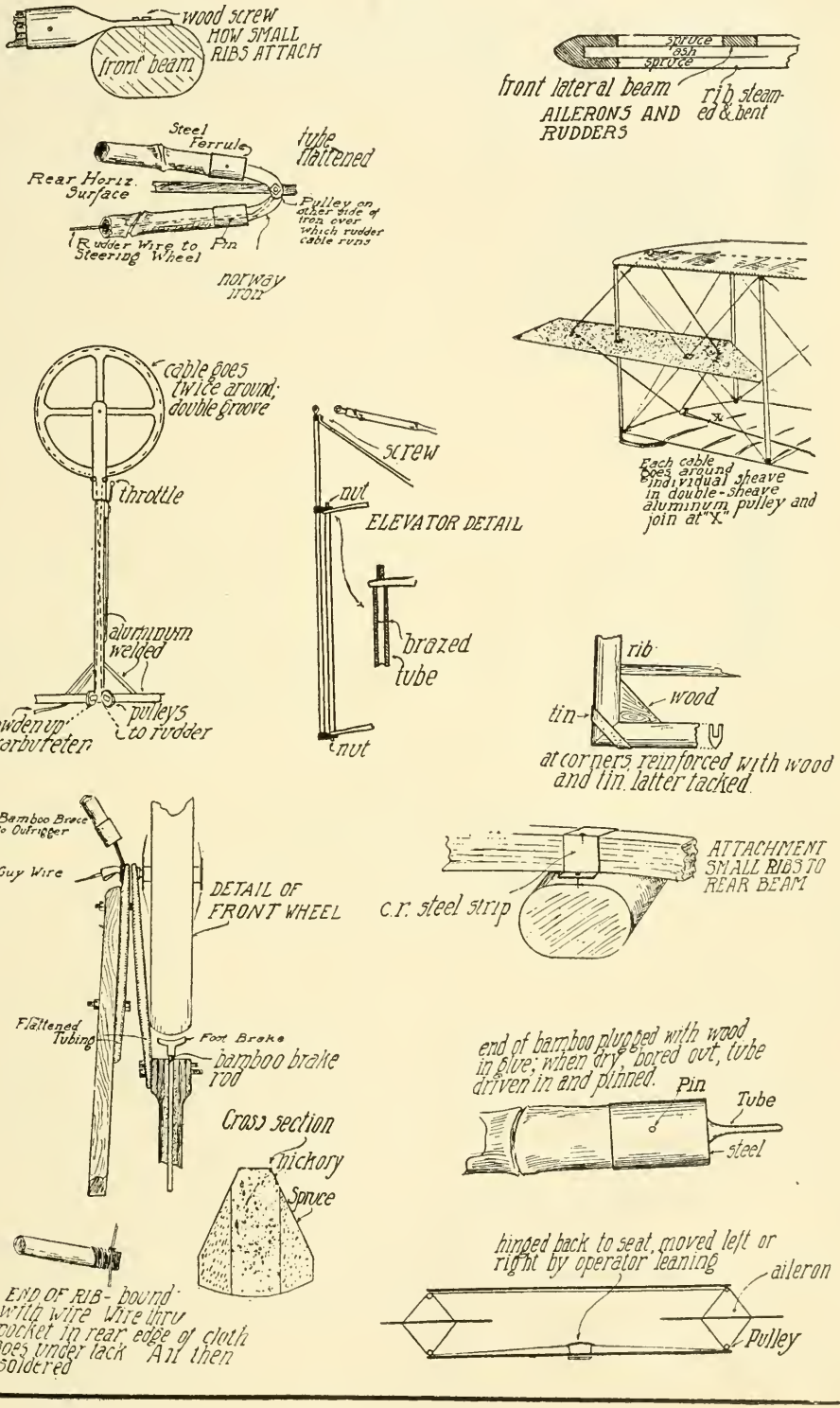
115 wires in the machine which need turnbuckles, the number required will be either 115 or 230, depending on which of these plans is followed. Those of the turnbuckles to be used on the front and rear controls and the ailerons, about one-fifth of the total number, may be of lighter stock than those used on wires which carry part of the weight of the machine.

MAKING TURNBUCKLES FOR THE TRUSS WIRES.

On the supposition that the builder will make his own turnbuckles this process will now be described. As will be seen from the illustrations, the turnbuckles are simply bicycle spokes, with the nipple caught in a loop of sheet steel, and the end of the spoke itself twisted into an eye to which the truss-wire can be fastened. The sheet steel used should be 16 or 18 gauge, and may be cut with a heavy pair of tinsnips to the pattern. The spokes should be 3/32-inch diameter over the threaded part. The eye should be twisted up tight and brazed so that it cannot come apart. The hole in the middle of each strip is of course drilled the same size as the spoke nipple; the holes in the ends are 3/16-inch.

In the original Curtiss machines the turnbuckles were strung on the socket bolts one after another, sometimes making a pack of them half an inch thick. A much neater construction is the one shown in the drawings, in which the bolt pierces a single plate with lugs to which the turnbuckles are riveted. These plates are of different shapes, with two, three or four lugs, according to the places where they are to be used. They are cut from steel stock 3/32-inch thick, with ¼-inch holes for the socket bolts and 3/16-inch, or other convenient size, for the rivets that fasten on the turnbuckles.

*Begun in the February number.



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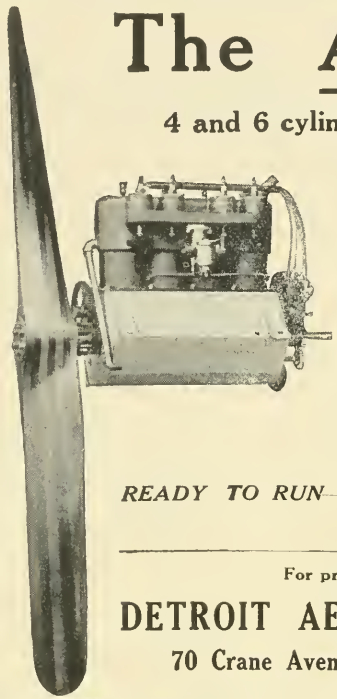

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Thanking you again, I am,

Yours very truly,
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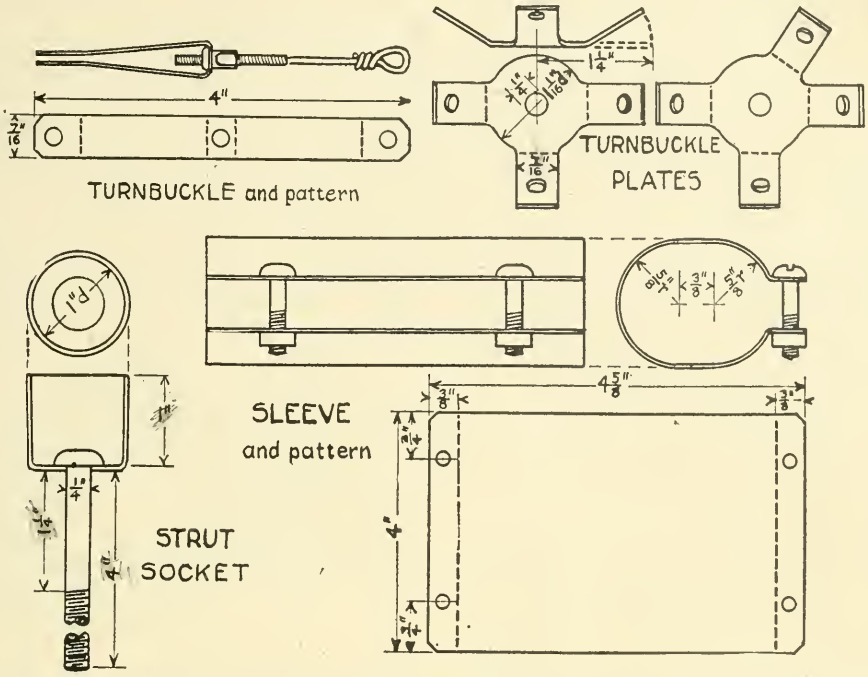
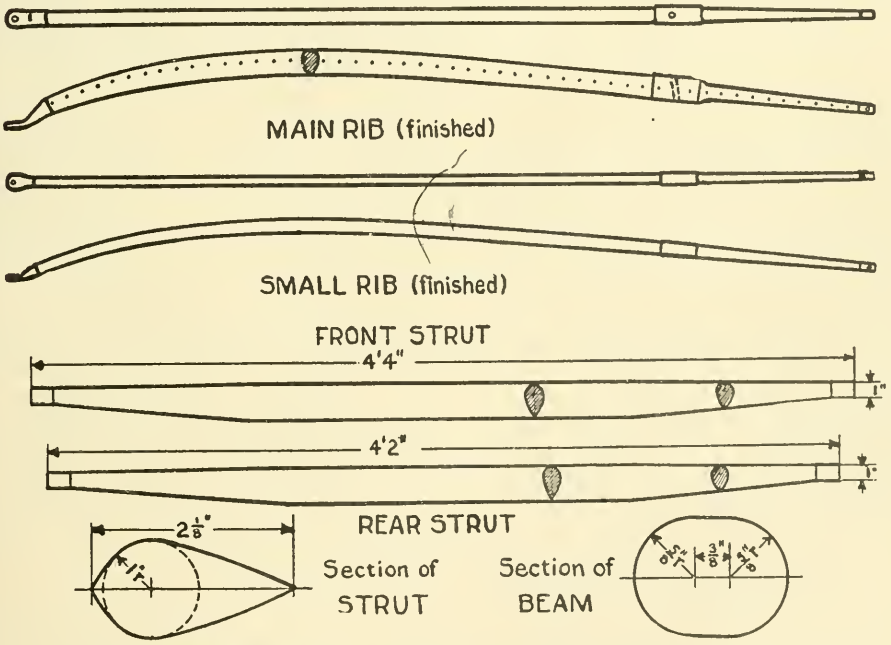


Small Parts, Mostly of Sheet Steel, Used to Joint Together the Beams and Struts.



The Wooden Parts Necessary in Building up the Main Planes of the Biplane.

The relative merits of cable and piano wire for trussing have not yet been thoroughly thrashed out. Each has its advantages and disadvantages. Most of the well-known builders use cable; yet if the difference between 1,000 feet of cable at 2¼ cents a foot (the price for 500-foot spools) and 8 pounds of piano wire at 70 cents a pound looks considerable to the amateur builder, let him by all means use the wire. The cable, if used, should be the 3/32-inch size, which will stand a load of 800 pounds; piano wire should be 24 gauge, tested to 745 pounds. It should be noted that there is a special series of gauges for piano wire—"music-wire gauge," it is called—in which the wire gets larger with the larger gauge numbers.

One by no means unimportant advantage of the piano wire is that it is easier to fasten into the turnbuckles. A small sleeve or ferrule, a ¼-inch length of ⅛-inch tubing, is first strung on the wire. The end of the wire is then passed through the turnbuckle eye, bent up, thrust through the sleeve, and again bent down. When the machine is taken apart, the wire is not disconnected from the eye, but instead the turnbuckle spoke is unscrewed from the nipple. The shape of the sheet-steel loop should be such as to hold the latter in place. Cable, on the other hand, must be cut with about 2 inches to spare. After being threaded through the turnbuckle eye, the end is wound back tightly on itself and then soldered, to make certain that it cannot come undone.

Assembling the machine completely requires more space than is available in the average workshop. However, it is possible to assemble the sections of the planes in a comparatively small room, carrying the work far enough to make sure that everything will go together properly when the time comes for complete assembly at the testing ground. In this case, it is preferable to assemble the end sections first, stowing them away when complete to make room for the central section, on which the running gear and outriggers are to be built up.

TWO SECTIONS TO BE ASSEMBLED AT ONCE.

Either way, it is desirable to be able to assemble two sections at once, and this should be possible anywhere, as it only requires a space of about 6 by 13 feet. Two wood 2 by 4's about 12 feet long should be nailed down on blocks on the floor to make beds level, parallel to each other at a distance of 3 feet 6 inches on centers, and one 3 inches higher than the other. Strips of wood should be nailed on them so as to hold the main beams of the frame in place while assembling.

The two front and two rear beam sections are laid in place and joined with the sheet-steel sleeves; the flanges of the sleeves go on the inner sides of the beams. Then through the sleeves in the front beams, which are, of course, those on the higher bed, drill the holes for the strut socket bolts (¼ inch). The holes for the outer ones go through the projecting ends of the beams; those for the inner ones are half in each of the abutting beams. At the end where the central section joins on, a short length of wood of the same shape as the beams may be inserted in the sleeve while drilling the hole. An assistant should hold the beams firmly together while the holes are being drilled.

Now lay in place the three main ribs belonging to the two sections under construction, and fasten them at the front ends by putting in place the strut socket. (See drawing.) The bed on which the assembling is being done should be cut away sufficiently under the joints to leave room for the projecting bolt ends. Set the ribs square with the front beams, and then arrange the rear beams so that their joints come exactly under the ribs; clamp the ribs down and drill a true vertical hole through rib and beam, holding the two sections of the beam together as before. Then put the rear strut sockets in place, using angle washers (described previously) above and below the rib.

When the quick-detachable plan is used, the ribs at the inner ends of the double sections, where they join the central section, should be bolted on one inch from the ends of the beam, using ¼-inch stove bolts instead of socket bolts. The sleeves should be slotted so that they can slide off without removing these bolts, as the sleeves and the ribs which occupy the regular position over the joints of the beams belong to the central section.

The sections should now be strung up with the diagonal truss-wires, which will make them rigid enough to stand handling. The wires are attached at each end to the flange-bolts of the sleeves. Either one or two turnbuckles may be used on each wire, as explained before; if but one turnbuckle is used, the other end of the wire may conveniently be attached to a slip of sheet steel bent double and drilled for the bolt, like the sheet-steel loop of a turnbuckle.

The attachment, of whatever nature, should be put between the nut and the flange of the sleeve, not between the two flanges. Three or four small ribs go on each section; four are preferable on sections of full 6-foot length. They are, of course, evenly spaced on centers. At the front ends they are attached to the beam by wood screws through their flattened ferrules. The attachment to the rear beam is made with a slip of sheet steel ½ by 3 inches, bent over the rib and fastened to the beam at each side with a wood screw. A long wire nail is driven through the rib itself into the beam.

FIRST HAVE THE TWO WINGS COMPLETED.

Four double sections should be built up in this manner; the right and left upper and the right and left lower sections. Uppers and lowers are alike except for the inversion of the sockets in the upper sections. Rights and lefts differ in that the outer beams are long enough to fill up the sleeves, not leaving room for another beam to join on.

Inserting the struts in their sockets between upper and lower sections of the same side will now form either of the two sides of the machine complete. Care should be taken to get the rear struts the proper length with respect to the front ones to bring the upper and lower planes parallel. The distance from the top of the lower front beam to the top of the upper front beam should be the same as the distance between the rows of lacing holes in the upper and lower main ribs just above and below the rear struts—about 4 feet 6 inches. It should not be necessary to mention that the thick edges of the struts go to the front—they are "fish-shaped," and a fish is thicker at the head than at the tail.

The truss-wires may now be strung on in each square formed by struts, beams and main ribs, using turnbuckles as previously described. The wires should be taut enough to sing a low note when plucked between the thumb and finger; if the construction is accurate the frame-work will stand square and true with an even tension on all wires. It is permissible for the struts to slant backward a little, as seen from the side, but all should be perfectly in line.

For adjusting the turnbuckles the builder should make himself a handy little tool usually called a nipple wrench. It is simply a strip of steel about 1½ by ½ by 3/32 inches, with a notch cut in the middle of one of the long sides to fit the flattened ends of the turnbuckle nipples. This is much handier than the pliers, and does not burr up the nipples.

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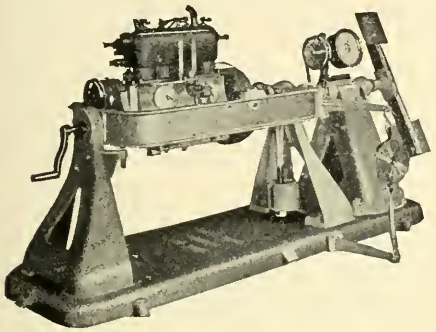

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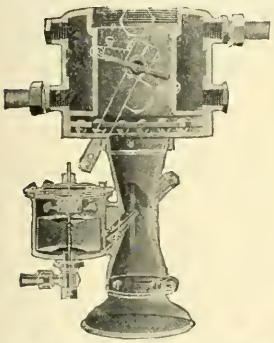

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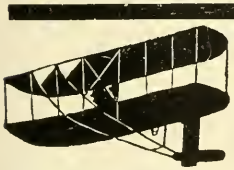

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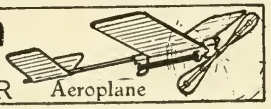

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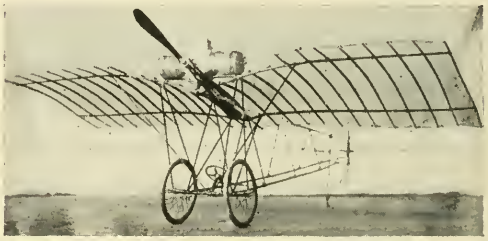

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MIDDLE SECTION TAKEN UP AFTER WINGS.

It has been assumed in this description that the builder is working in a limited space; if, on the contrary, he has room enough to set up the whole frame at once, the work will be much simpler. The construction bed should in this case be the full 30 feet in length. First build up the upper plane complete, standing it against the wall when finished; then build up the lower plane, put the struts in their sockets, and lay on the upper plane complete.

Returning to the plan of assembly by sections; after the side sections or wings of the machine have been completed, the struts may be taken out and the sections laid aside. The middle section, to which the running gear and outriggers will be attached, is now to be built up in the same way. If the builder is using the plan in which there is one main rib between each section, it will be necessary to take off the four inner main ribs from the sections already completed, to be used at the ends of the central sections.

The plan drawing of the complete machine shows that the ribs of the central section are cut off just back of the rear beam to make room for the propeller. This is necessary in order to set the motor far enough forward to balance the machine properly. The small ribs in this section have the same curve, but are cut off 10 inches shorter at their rear ends, and the stumps are smoothed down for ferrules like those of the other small ribs. In the plan which has one main rib between each section, the main rib on each side of the central section must be left full length; in the quick-detachable plan, with two main ribs on each side of the central section, the inner ones, which really belong to this section, are cut off short like the small ribs.

In one large drawing the distance between the struts which carry the engine bed was shown as 2 feet. This was only approximate; the distance may be varied to suit the engine to be used. The builder should by this time have decided what engine he wants (or can get), and should drill the holes for the sockets of these struts with due respect to the width of the engine's supporting feet or lugs, remembering that the engine bed beams go on the inner sides of the struts. In the drawing of the running gear the distance between the engine-bed struts has been designated A; the distances BB on each side are of course ½ (6 feet—A), whatever A may be.

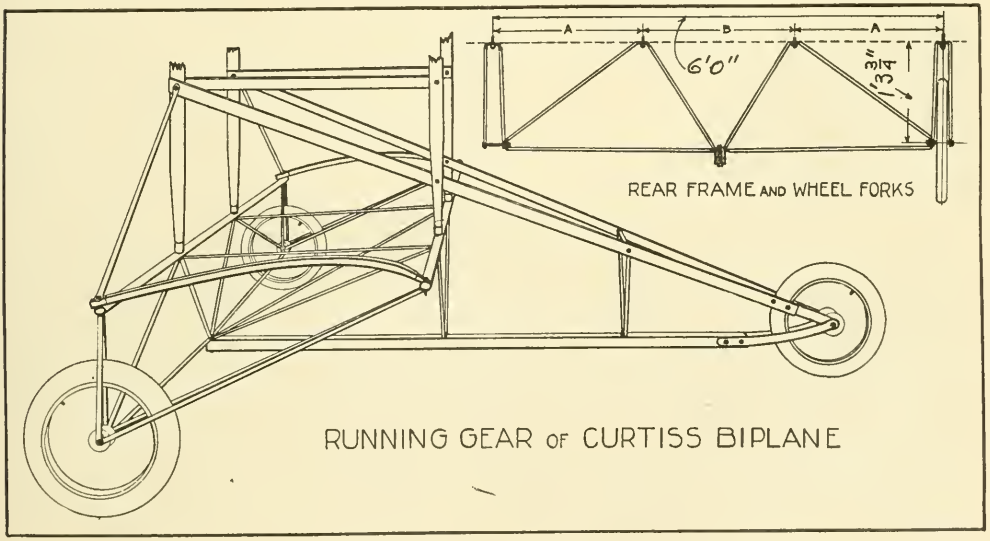
RUNNING GEAR.

The running gear of the machine is built of seamless steel tubing. Those parts which carry directly the weight of the machine are ¾-inch outside diameter and 16 gauge; others are ⅝ O. D. by 18 or 20 gauge. About 25 feet of the heavy and 45 feet of the light tubing will be required, in lengths as follows: heavy, four 3-foot, three 4-foot; light, one 6-foot, two 4-foot 6 inches, seven 4-foot. Referring to the drawing, the two diagonal braces from the rear beam to the engine bed, the V-shaped piece under the front engine-bed struts, and all of the rear frame except the horizontal piece from wheel to wheel, are of heavy tubing. The horizontal in the rear frame, the diagonals from the rear wheels and the rear end of the skid to the front beam, the two horizontals between the front and rear beam, and the forward "V" are of light tubing.

Three ash beams are used in the running gear. Two of these run diagonally from the rear end of the engine bed to the front wheel; these are about 10 feet long and 1 by 1¾ inches in section. The third, which on rough ground acts as a skid, is 8½ feet long and about 2 inches square. Between the points where tubing frames are attached to it, the upper corners may be beveled off with a spokeshave an inch or more down each side. The beams are attached to the front wheel with strips of steel stock 1½ inches wide and ⅛ inch thick. The engine-bed beams are also ash about 1 by 1¾ inches. Their rear ends are bolted to the middle of the rear engine-bed struts, and the front ends may be half an inch higher.

Wheels are usually 20 by 2 inches, of the bicycle type but heavier and wider in the hub; the tires are single-tube. These wheels with tires complete cost about $10 each. This is the size used on standard Curtiss machines, but novice operators, whose landings are not quite as gentle as they might be, find them quite easily broken. Therefore, it may in the end be more economical to pay a little more and get larger tires, at least to start with.

(To be continued)



Perspective Drawing Showing the Running Gear Complete, and Rear Frame in Detail.

News In General

CURTISS PLANT SOLD.

On February 10 the Herring-Curtiss motorcycle engine and aeroplane plant at Hammondsport, N. Y., was sold by the Receiver back to Glenn H. Curtiss, the original owner (before the incorporation of the defunct Herring-Curtiss Company), who bid it in for $18,418.75. Mr. Curtiss has been using the plant under lease from the Receiver for some time. The idea of locating permanently in California will now be abandoned.

ARMY APPROPRIATION PASSES.

The Senate has passed the bill containing an appropriation of $125,000 for army aeronautics, previously passed by the House, on Feb. 7, and made $25,000 immediately available.

The navy, which is interesting itself practically, will not receive any of this, but has asked for $25,000 for itself and intends to keep well to the front in aeroplane matters.

ANOTHER STABILITY DEVICE.

A Portland (Ore.) man, Henry B. Blomgren, of 850 East Ash Street, believes he has invented a device which will act as a counterbalance to an aeroplane when it is making quick turns in the air. The invention is what has been called an "automatic stabilizer," and it is intended to act automatically to preserve the balance of an aeroplane. According to the inventor, the device prevents any aeroplane from turning turtle. It consists of a counterweight attached to the aeroplane in such a way that it traverses an aluminum track at the wings of the aeroplane dip to either side. When the list is to the left, the counterbalance runs up the track to the right, serving as a balancer. The greater the list, the greater the weight of the counterbalance on the upper side.

Within a few weeks it is intended to make a practical demonstration of the stabilizer, and as soon as this takes place the inventor expects to take the device East and try to have some prominent manufacturer give it a trial. The stabilizer is now on exhibition at a local store.

AERO SCHOOL IN KANSAS CITY.

Rahe & Bennett, of 1108 Locust Street, Kansas City, Mo., are establishing an aeronautic school under the name "Aviation Training School of Kansas City," with offices at the above address. Sheds are now being built at Overland Park, in the State of Kansas, where the flying will be done, and at the city office two machines are now under way which the promoters think "will revolutionize the flying game."

Each student will have four weeks on motors before taking up flying. The school states that it will not cater to students who want to do exhibition work.

BIG AIRSHIP IN CALIFORNIA.

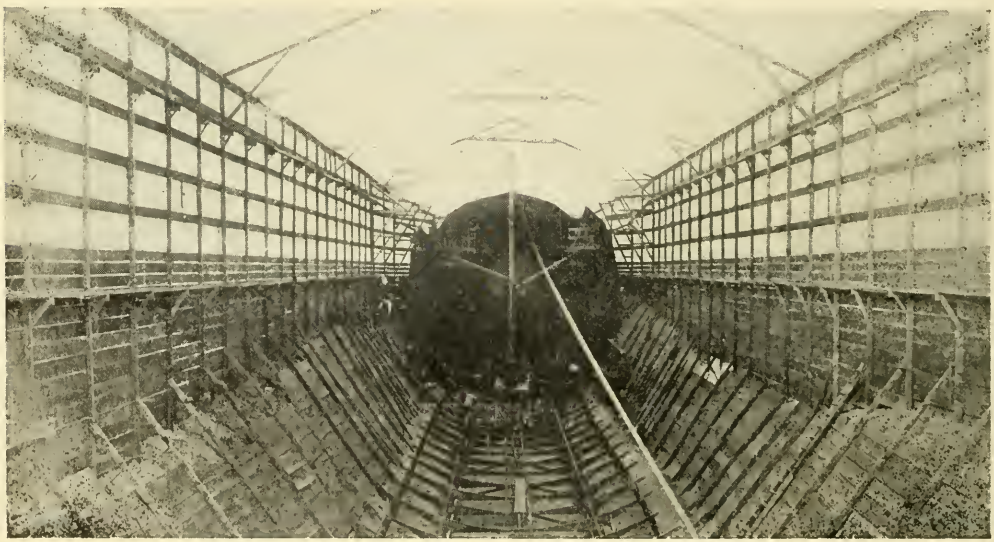
When completed, the largest airship in America will be that of the Toliver Aerial Navigation Company, temporarily located at San Diego, Calif. The ship is to be "launched" within the next two or three months.

This rigid airship differs from all others, as it has no pendent baskets or rudders. Passengers and crew are to be comfortably housed in conveniently and ingeniously arranged cabins and conning towers, all of which are contained within the main circle of the ship, which is of cigar shape. At least, that's what the builders promise. The ship will be steered and its elevation controlled entirely by propellers, of which there are six, two at either side and one at each end, mounted on flexible shafts, working through ball and socket joints so as to be turned to push or pull in any desired direction in rapid succession.

The length is 250 ft. and 40 ft. diameter, and is said to be capable of carrying forty passengers of average weight.

Aero School in New York.

An indoor aeronautic school has been established more than a month now at 312 West 52d street, New York, under the title Aeronautic School of Engineers. H. J. Winter is general manager, and W. G. Scott, chief engineer. A flight course is scheduled to start on the Hempstead Plains, near Mineola, April 15.



Toliver Airship Shed—Bow of Airship in Background.

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WASHINGTON AERONAUTICAL SHOW MARCH 5 TO 12.

Washington will have its first national aeronautical exposition on March 5 to 12, inclusive. The exhibit will be held in Exposition Hall, one of the largest buildings in the country, which has just been completed at M and North Capitol streets. At least ten machines, representing various types of monoplanes and biplanes, will be on exhibit for eight days.

In addition to aeroplanes, models, gliders, aerial motors, propellers and hangars, aeronautical supplies of all kinds will be shown. Automobiles and motor trucks also will be exhibited. The floor space in Exposition Hall amounts to nearly 2 acres. On one side of the building it is planned to have large passenger-carrying machines in actual operation. With the engine throttled down, the machine will be run around the hall, and a ride in an aeroplane will be one of the features of the exposition.

The exposition will be held under the auspices of the National Aviation Company, and many of the largest manufacturers of aeroplanes and aeronautical supplies have signified their intention to participate in the exposition. The date for the exhibit was selected just after the adjournment of Congress to give the members of the House and Senate, as well as the officials of the Government, a practical demonstration of what has been accomplished during the past year.

BOOK REVIEWS.

ALL THE WORLD'S AIRSHIPS. By Fred T. Jane. Cloth, 438 pp., glossary and index, fully illustrated. Published at 21 shillings ($5.25), by Sampson Low, Marston & Co., Ltd., Overy House, 100 Southwark Street, London, S. E., England.

This is the second year of issue of the "Flying Annual," by the same author. In 1910 the first number appeared. This has been revised and added to and covers, as near as the author could secure information, every aeroplane and dirigible flying or under construction in the principal countries of the globe, with dimensions, half tones and drawings. The work is divided in three parts: (1) Aeroplanes and dirigibles of the world; (2) the world's aerial engines; (3) aerial directory and "Who's Who." A glossary of technical terms will be found of value, with their equivalents in French, German and Italian. There is a list of clubs, flying grounds, journals, etc., and a world-wide directory of aeroplane, dirigible and accessory manufacturers.

Many an American inventor, unknown to the aero world here, will find his device illustrated and described, while many well known will be found duly designated.

The work is well worth a place in every library. The aero clubs should make a point of furnishing corrections, so that future editions will still more deserve widespread recognition.

AEROPLANE PATENTS. By Robert M. Neilson. 8vo., cloth, 91 pp., illustrated. Published by D. Van Nostrand & Co., 23 Murray Street, New York, at $2.00.

The book contains a list of all patents relating to aviation granted in England from 1860-1910, inclusive, and in the United States from 1896-1909, inclusive. These are arranged both alphabetically and numerically. The greater portion of the book is devoted to clear, concise abstracts in very readable form, with many drawings, of the principal British patents. Another very complete section covers advice of all kinds on the obtaining and exploiting of patents. The British Chanute, Wright, Herring and other American patents are very well described. One of the Herring patents employs gyroscopic action of propellers, through propeller shafts movable in a horizontal plane, to actuate fore and aft rudders for longitudinal stability, etc.

GLIDING. By Percy S. Pilcher, to which is added the aeronautical work of John Stringfellow, is the fifth of the "aeronautical classics" being published by the Aeronautical Society of Great Britain. This is a little booklet of absorbing interest of some 40 pages. The contents include an account of Mr. Stringfellow's work, in addition to many details of the Pilcher glider. The booklet is illustrated with drawings and half tones. This can be obtained from King, Sell & Olding, 27 Chancery Lane, London, W. C., at 25 cents.

PRINCIPLES AND DESIGN OF AEROPLANES. By Herbert Chatley, B. Sc., A. M. I. C. E. I., 12 mo., cloth, 110 pp., 50 cents D Van Nostrand & Co, 23 Murray Street, New York.

Contents: The Aeroplane, Aid Pressure, Weight and Power, Propellers and Motors, Balancing, Construction, Difficulties, Future Development, Cost, Other Flying Machines. This little book ought to prove of interest to all starting a course of reading. It covers in a general way, and concisely, the principles of aeronautics and outlines the work to be done in gaining a fair technical knowledge of the science.

JAHRBUCH UBER DIE FORTSCHRITTE AUF ALLEN GEBIETEN DER LUFTSCHIFFAHRT. By Ansbert Vorreiter. 8 vo., cloth, 500 pp., 641 pictures with many tables and large inserted drawings. Published by J. F. Lehmann's Verlag, Munchen, Germany. Price 10 M.

Contents include: I. **Die Luftflotten der Kulturnachte:** Der gegenwartige Bestand an Luftschiff—Leistungen der Luftschiffe im Jahre 1909—Die deutschen Luftschiffsysteme—Die osterreichischen Luftschiffe—Die franzosischen Luftschiffe—Die englischen Luftschiffe, etc. II. **Die erfolgreichsten Flugmaschinen der Gegenwart.** Allgemeines—Deutsche Flugapparate—Franzosische Flugapparate, etc. III. **Motoren fur Luftschiffe und Flugapparate.** IV. **Gleitflieger und Drachen.** V. **Der Freiballoon und Fesselballoon, with Records.** VI. **Luftschiffhallen und Luftschiffhafen. Luftschiffhallen und** Luftschiffwerften in Deutschland, etc. VII. **Fortschritte in der erzeugung von Ballongas.** VIII. **Waffen zur Bekampfung von Luftschiffen.** IX. **Flugplatze und Flugfelder.** X. **Fortschritte der wissenschaftlichen Forschung auf dem Gebiet der Luftschiffahrt und Flugtechnik.** Anhang zum wissenschaftlichen Teil. XI. **Die bedeutendsten deutschen Patente auf dem Gebiete der Luftschiffahrt.** XII. **Der Flugsport, with records, etc.** XIII. **Vereinswesen.** XIV. **Bezugsquellen-Verseichnis.** This book has a wonderful store of reliable information. It is certainly one of the very best books in recent years.

INCORPORATIONS.

Piceller Aeroplane & Supply Co., $10,500. Incorporators: Harold W. Krausman, N. Y.; Charles Meissner and Rudolph Jung, Brooklyn, N. Y.

American Aeroplane Co., Los Angeles, Cal., $500,000. A. W. Kellogg, M. C. Tunison and W. B. Kibbey.

International Aviation Co., Detroit, Mich., $100,000. Stockholders: Harold McIntyre, Charles J Strobel, Stanley Vaughn.

Dyker Aeroplane Co., Yonkers, N. Y., $30,000. Incorporators: T. Windel, W. Krahe, G. Guhmann.

Franco-American Aviation Co., Chicago, $2,500. Incorporators: Walter R. Sollitt, Otto W. Brodie, Joseph W. Latimer.

National Aero Co., New York, $5,000. Directors: Childe Harold, 14 Irving Place, New York; W. B. Gosman, 39 Franklin Avenue, New Rochelle, N. Y.; Jacob Friedman, 1930 Madison Avenue, New York.

Myers Plane Co., Buffalo, N. Y., $25,000. Directors: Charles Cary, 340 Delaware Avenue; Bronson Rumsey, 132 W. Tupper Street; H. M. Gerrans, 513 Delaware Avenue.

Brown Aeroplane Co., 3813 Roland avenue, Baltimore, Md., $5,000.

U. S. Aeronautic Co., Hartford, Conn., $100,000.

Harriman Aeromobile Co., Boston, Mass., $1,000,000.

AERO MOTORS IN AMERICA

DIGEST OF AMERICAN MOTORS

In the succeeding issue there will be a table giving the main details of all American-made aero engines. This will be a most complete affair and will show at a glance the entire motor field in this country.—Editor.

The New Model "Kirkham" Aeroplane Motor.

The latest production of Charles B. Kirkham, of Bath, N. Y., who for several years has been well known as the designer and builder of the well known line of automobile motors that bear his name and who recently resigned his position as general manager and designer of the Kirkham Motor Manufacturing Company to take up the manufacture of aeroplane motors as a specialty, is illustrated in the line drawings shown herewith. This motor is designed along lines closely following high class automobile practice, so far as general arrangement of cylinders, etc., are concerned, as it was thought better to sacrifice whatever saving in weight may be gained by the various freak arrangements of cylinders, with their attendant difficulties in the matter of lubrication, etc., for the well tried out in every day automobile practice type of motor, but, however, with numerous detail improvements in valve systems, lubrication systems, etc., together with a very clever design which results in a motor having to the greatest possible degree durability and reliability, and at the same time being reasonably light in weight.

Before deciding on the design of this motor every possible type of motor was thoroughly investigated with a view of determining the advantages and disadvantages of the various types, and it was finally decided that for medium powers the six cylinder vertical four cycle type, properly designed for the particular service in view, was to be preferred, as this type has been found to offer the greatest number of advantages with the least number of working parts, meaning light weight without unduly cutting down the weight of individual parts.

The six cylinder vertical type of motor, properly built, has been found to be almost perfectly balanced, both when under load or running idle, as the motor being described will run at over 2,000 r. p. m. without being in any way fastened down and not show any signs of distress.

Among the advantages of the six cylinder vertical type motor is the greatly reduced end area exposed, thus reducing head resistance, which is equal to a gain in power, also the ease with which a motor of this type can be enclosed and protected from the weather in a compact, efficient cover, which is bound to be one of the near future improvements in aeroplane construction.

This type of motor has also been found to be exceptionally desirable for continuous high speed running on account of the almost entire absence of vibration, and the ease of uniform and economical lubrication, also on account of the high thermal efficiency, especially of the motor under consideration, owing to the new system of inlet and exhaust valves.

The new "Kirkham" aeroplane motor shows evidence of considerable experience on the part of the designer, as can be seen by referring to the line drawings accompanying this article. The crank cases are made in two parts, joined on the horizontal center line. The upper half carrying all the bearings, cylinders, etc., while the lower half serves as an oil supply tank and splash basin. The upper half is made of McAdamite alloy, while the lower half is a very light aluminum alloy. The rear end of the case is extended several inches more than usual so as to receive a ball thrust bearing and also to get propeller as far away from cylinders as possible, which is an advantage, especially for monoplane use, where a propeller is ahead of an engine.

The six throw crank shaft is cut from a solid billet of Krupp's chrome nickel steel, grade E-F-60-0, and has the flange for propeller forged solid on rear end. All journals are made hollow for lightness. The weight of complete shaft is 23 pounds. It is 1½ inches in diameter and is supported in seven high grade babbitt bearings, also one large annular ball bearing at rear end next to propeller, which takes the thrust, or pull, and at the same time steadies the shaft close to the propeller.

The piston pins are made from 3½ per cent. nickel steel seamless tube, casehardened and ground, and are ⅞ inch in diameter. The bearing for this pin being in the bosses of the piston, while pin is fastened tight in top end of connecting rod.

The piston rings, two to each piston, are made of special mixture of cast iron, eccentric turned, and ground on sides and outside diameter. They also have fine oil grooves in center. These rings are carefully lapped to fit cylinders before assembling.

The pistons are made from a fine grade of cast iron, and are very light, but well ribbed for strength. Weight of 4⅛ inch piston, 33 ounces.

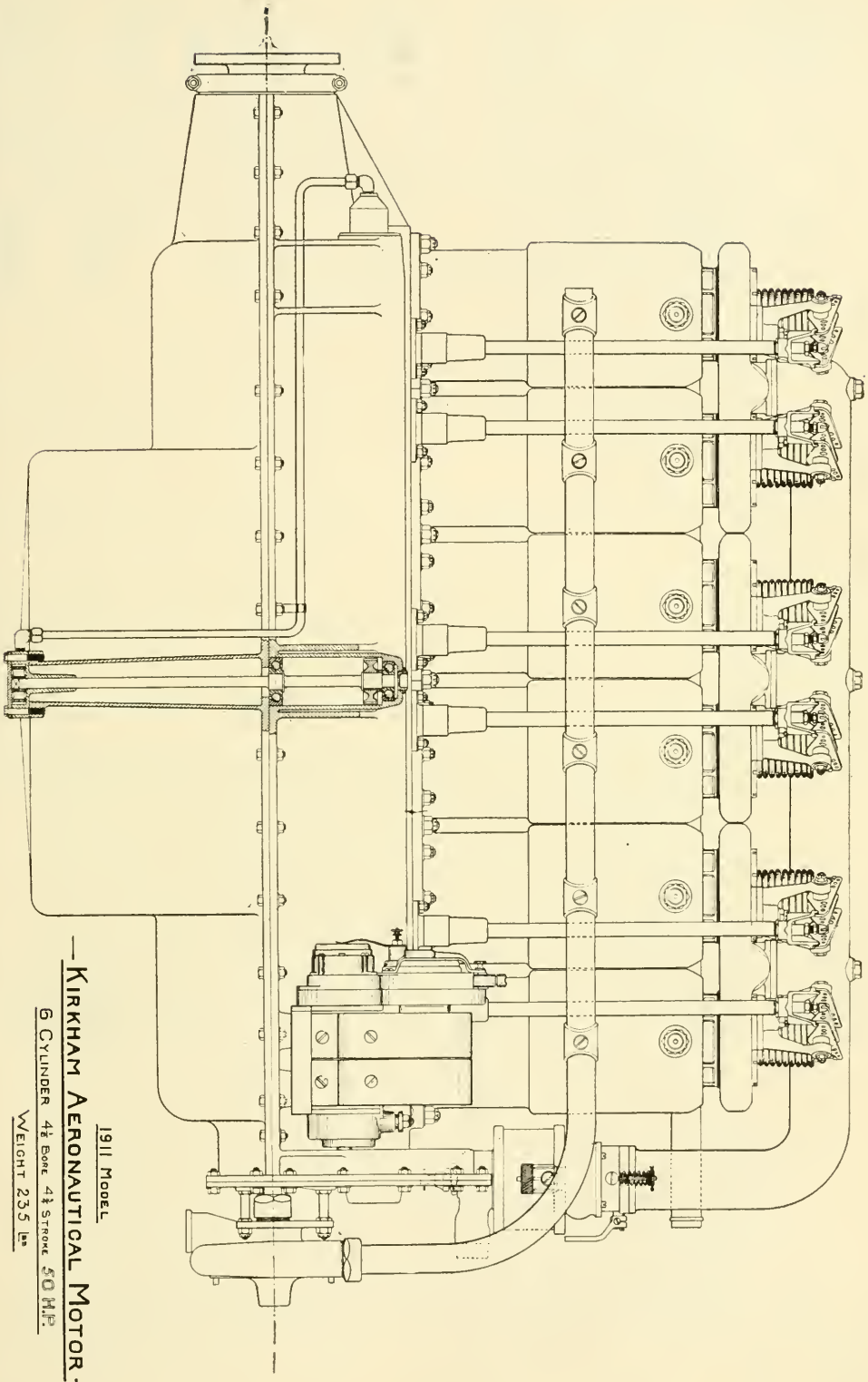
The cylinders are made from a special grade of cast iron which has been found by past experience to be best adapted to this particular purpose. These cylinders, with their integral jackets, are so shaped that they may be finished all over, inside and out, being ground on the inside, and turned and nickeled on the outside. The combustion chamber is of spherical shape and machined.

The connecting rods are nickel steel drop forgings of I section, carefully finished and made as light as consistent, with ample factor of safety. The lower end bearing is 1 7-16 inches diameter, 2⅛ inches long, removable, special babbitt bearings.

The cam shaft is machined from nickel steel, bored, casehardened and ground, standard of accuracy being within .0005.

The main bearing lubrication is effected through the camshaft in a very ingenious manner. The oil is pumped under pressure from the oil reservoir, which is integral with the lower half of the crank case to the end of the cam shaft, by means of a small geared pump, which is shown in section in the drawing. From the cam shaft the oil is distributed to the cam shaft bearing through holes suitably drilled so as to supply oil to these bearings. The large end bearings on the connecting rods are lubricated in a similar way from the cam shaft, oil holes being drilled in the latter in such a position that at every second revolution of the crank shaft the hole in the cam shaft is just opposite the large end bearing, and a stream of oil is thrown onto it, a suitable hole being arranged in the large end bearing to convey the oil to the oil grooves in the bearing on the crank pin. This same oil, after working through the large end bearing, is thrown in all directions by centrifugal force, and as ample quantity is thrown up onto the piston and cylinder walls the advantages of this system are at once obvious.

First, the quantity of oil pumped to various parts of the motor varies almost directly with the speed of the motor, thus, before starting a flight, when the motor is throttled down, less oil is pumped onto the cylinder walls and consequently the engine does not get over-lubricated. When, however, the throttle is open and the motor speeded up, considerable more oil is pumped and ample lubrication is supplied for a long continued, full load run. The rocker arms on top of the cylinders are lubricated through the central pin, on which they oscillate, this pin being drilled and filled with



1911 Model.

—KIRKHAM AERONAUTICAL MOTOR—

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Weight 235 lbs

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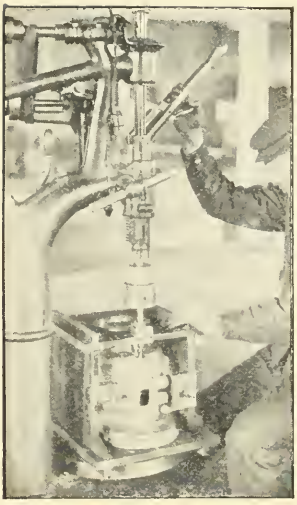
grease, an adjusting plug being fitted in the ends by means of which the grease can be forced through a hole in the pin onto the bearing surfaces.

The valve gear of the 1911 "Kirkham" differs from common practice very greatly, as may be seen from the cuts of the valve mechanism, this valve arrangement forming the subject of a patent. This type is what might be said to be a combination of a poppet valve and a sliding sleeve or piston valve. Referring to the cut of the valve unit, it will be seen that both the poppet and piston valves are concentric and are operated by rocker arms, pivoted on top of the cylinders. It will also be noticed that with this system of valve gear it is possible to get a very desirable shape of combustion chamber, and that there is only one valve seat subjected to the pressure of the explosion.

The Simms high tension magneto, type S-6, is fitted as standard, with Bosch or Mea magnetos optional. High grade imported spark plugs are fitted.

The weight of this motor complete with carburetor, magneto, and all other accessories, is 235 pounds; extra weight for radiator, 34 pounds; for propeller, about 10 pounds.

This motor, 4⅛ inch bore, 4¾ inch stroke, develops 50 brake horsepower at 1,300 r. p. m., and 60 brake horsepower at 1,600 r. p. m.

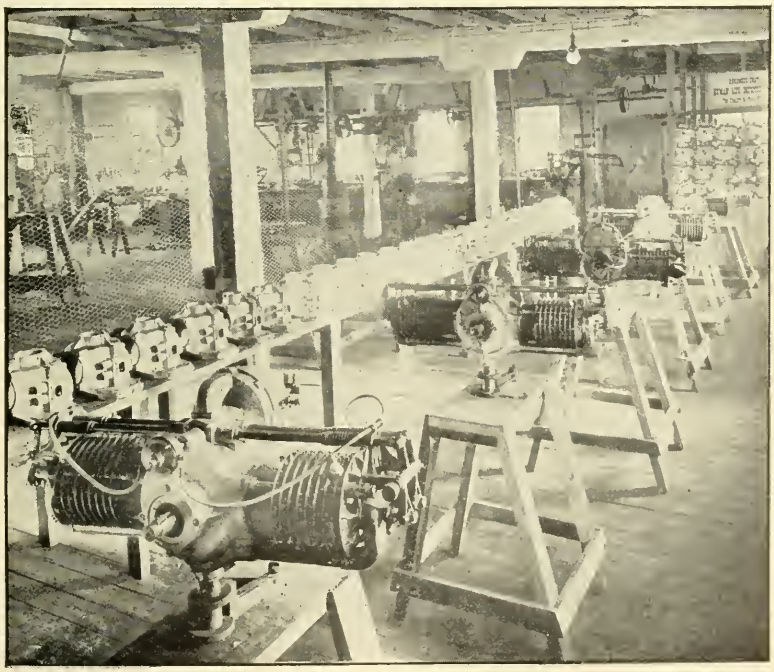


America Sells Aero Motors Abroad.

The Detroit Aeroplane Company, of Detroit, Mich., which is engaged in the manufacture of the Detroit Aero, have recently moved to their own new factory, corner Champlain and Meldrum, facing the second railroad belt line of the city of Detroit. Encouraged by a larger order from their representative in Paris in November, 1910, they started to build a series of 1,000 engines of their 1911 model, which are pushed through in batches of 100 at a time at the Detroit plant.

The present capacity of their factory is six complete power plants per day, without additional night shift. The picture shows the assembling room and the power plant complete.

It is a fact worth noting that the engine parts are built interchangeable, and the smaller picture shows a crank case drilled and tapped in a jig, which has a capacity of fifty-four complete crank cases in ten hours. This jig work reduces the manufacture cost just 80 per cent., in return for which the company can sell the complete power plants for a very low price and still make a fair profit. Only complete power plants are sold, and they guarantee the same to weigh 150 lbs. and to deliver a minimum thrust of 200 lbs., the average thrust is 225 lbs. and the best maximum thrust so far obtained was 255 lbs. Experiments are still made to increase the thrust.



Berliner Will Build a New Aeronautical Motor.

It is probably but little known that Mr. Emile Berliner, well known as the inventor of the telephone transmitter and the Victor talking machine, has given his attention for several years to the improvement of light gasoline motors of the revolving-cylinder type. Mr. Berliner was one of the very few scientific men who many years ago looked forward with perfect assurance to the achievement of practical and successful flight, and it was always his belief that the greatest problem lay in the development of light-weight engines of high power. Accordingly, when in the year 1905 he wished to carry out some experiments with aeronautical apparatus devised by him, he found it necessary either to build his own motors outright or to adapt such motors as he could obtain and modify them to suit his special purposes. About that time Mr. Berliner sent Mr. R. S. Moore, the chief assistant in his laboratory, to look into the merits of a revolving-cylinder motor then being made by the Adams-Farwell Company at Dubuque, Iowa, for automobile service. It was desired to have one or two of these motors put up in specially light form and construction, but it was only with difficulty and by paying the full purchase price entirely in advance that the manufacturers were persuaded to build two specially light motors for Mr. Berliner's particular use.

Upon receiving these two motors and testing them at Mr. Berliner's private laboratory in Washington, it was decided to rebuild them throughout. The cylinders were rebored and fitted with new pistons and all the other parts of the two engines were gone over in a similar manner to bring them up to the highest excellence of workmanship.

The results obtained with these two motors when rebuilt were so very encouraging that several entirely new revolving engines were built, embodying many new and valuable improvements that were suggested to Mr. Berliner and his associates by careful study and patient experiment. The excellent results obtained from these new motors finally induced Mr. Berliner to consider the formation of a company to manufacture motors for the aeronautical trade.

Accordingly, last fall the Gyro Motor Company was incorporated with a capital of $100,000. Mr. Berliner being president of the new company, and having associated with him Mr. R. S. Moore, already mentioned, and Mr. Lee Simmons, both men of genius and long experience in gas-engine construction and design.

Up to this time the work had been carried on entirely in Mr. Berliner's private laboratory, but in November of last year plans were prepared and ground broken for a new factory building at 774 Girard street, Washington, D. C.

For its general manager and consulting engineer the company has secured the services of Mr. Spencer Heath, a mechanical engineer and former patent attorney, who is also prominently connected with the American Propeller Company, making the well-known Paragon aeronautical propellers in Washington, D. C. The company considers itself well favored in having close relations with the designers of these propellers and has obtained a selling agency for the same.

The motor now being manufactured is a seven-cylinder, Gnome type, constructed of the highest grade of nickel and vanadium steels throughout. While the motor follows the general lines and appearance of the Gnome, there are a number of simplifications and radical improvements.

The fuel and oil are both fed through the shaft into the crankcase, whence the centrifugal action hurls them towards the inner ends of the cylinders. Here the vaporized fuel passes through a special intake valve in the center of the piston. Unlike the valve in the Gnome piston, this valve is operated by a simple and most ingenious mechanical device which utilizes the strong centrifugal force for both opening and closing the valve, the timing of the motion of the valve being controlled by the angular movement of the connecting rod about the wrist pin in the piston. This device eliminates a considerable number of small parts and insures a positive mechanical movement of the valve under all conditions, regardless of any suction or partial vacuum in the cylinder. In fact, no suction whatever need be required, since the centrifugal action whirls the charge through the open valve and into the cylinder.

The large exhaust valve is central in the cylinder head and is operated by a four-stage cam device which regulates the opening and closing of the valves so as to give a variable compression, at all times under control of the operator. This enables an aviator to start his engine running slowly on low compression, and after taking his seat and being all ready, he turns on the high compression, bringing the engine up to full power, and speeds off.

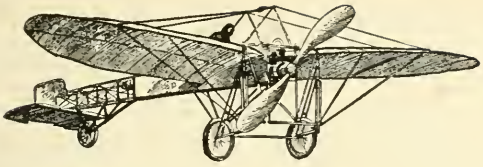
The elimination of the so-called spider for joining the connecting rods about the crank pin is another valuable feature.

It is perhaps not sufficiently well known that the spider connection used on other seven cylinder motors necessarily causes a different length of stroke and "throw" in the different cylinders and the different pistons reach the extreme of their compression strokes at irregular intervals. With the ignition occurring at regular intervals three and one-half times per revolution, if the explosion is properly timed for one cylinder there will be others in which the explosions occur very prematurely on the compression stroke, and still others in which they occur very late in the expansion stroke. This, of course, means a very inefficient and irregular running of the different cylinders and accounts for the jerky running of nearly all revolving motors at low speed. The Gyro Motor Company obviates all this irregularity by centering every connecting rod directly on the crankpin. The thrust and pull of the rod, however, is not taken by the direct connection on the pin, this merely serving to keep the rod properly centered, while the thrust is taken directly upon the outer rings of two heavy ball bearings mounted on the pin at sufficient distance apart to accommodate between them the seven thin terminal ends of the connecting rods by which the rods are held in proper alignment with the crankpin. With this arrangement there is absolute regularity and uniformity of action in every one of the cylinders, and they can be timed and set so that each develops its maximum power in a perfectly steady manner.

A still further improvement relates to the oiling of the cylinders. The lubricant is, of course, introduced mixed with the fuel, but the ordinary consumption of one gallon of castor oil for every two gallons of gasoline has been enormously reduced. Special provision has been made for carrying practically all of the oil to the cylinder walls instead of blowing it through the valve in the center of the piston and straight out the exhaust as is usually the case.

The inner portion of each piston is provided with a thin sheet metal hood of conical form with just sufficient opening at the center to accommodate the swing of the connecting rod. The centrifugal action throws the globules of oil outwardly with such force that they are not readily deflected, but practically all of them land on the slanting surface of the conical hood, whence they slide down to the external periphery of the piston and to the cylinder walls. The light vaporized fuel, however, readily passes through the opening at the center of the conical hood, through the positively opened valve at the center of the piston, and finally, after explosion, through the exhaust valve in the center of the cylinder head, having the full effect of centrifugal force urging it directly forward at all times and being followed up in its final exit by the fresh charge flowing freely in behind it.

With these numerous improvements, comprising the mechanically operated intake valves in the pistons, the variable compression under



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control of the operator, the elimination of the "spider," with resulting uniformity of timing and stroke in all the cylinders, and, finally, the adequate means for conserving the lubricant wholly to the cylinder walls, it is but little to presume that the new motor will yield practical results surpassing anything that has yet been achieved by any motor of the same class.

The first of these engines to appear on the market will have a bore of 4¼ in. by a stroke of 4¾ in. The rated horse power is 60 at 1,200 revolutions per minute, but it is thought that the actual power will exceed this.

The company expects to place a line of these motors on the market in a very few weeks, not soliciting orders, however, until after a full and complete demonstration of their power and endurance in actual flight. It is understood that the price, including mountings and Paragon propeller, will be about $2,500.

Concerning Eight-Cylinder Engines.

The consensus to-day among many who are in a position to know, is that the eight-cylinder "V" is the most efficient and reliable engine available. "It is the only legitimate aviation engine," is the way a prominent aviator recently expressed it.

Grahame-White has only just recently taken over the eight-cylinder, equipping several of his latest planes with engines of this type. Although White has heretofore been using the Gnome exclusively, his change from the Rotary to the "V" type would clearly indicate that even with a Gnome there are things yet to be desired.

By the use of eight cylinders continuous power can be arrived at, reducing to a minimum that vibration which causes molecular changes in the materials of which it is built, thus insuring longer life to every portion of the engine, more especially the most important portion of the engine, viz., the crank shaft.

In addition to Grahame-White, the latest recruit to the ranks of the eight-cylinder users, many of the most important and notable aerial trips have recently been effected by this design of engine. Curtiss on his flight from Albany to New York, Captain Baldwin in his exhibition work, and Hamilton, the hero of the New York-Philadelphia flight, are among the few on this side who acknowledge the eight-cylinder as superior to all other types.

Tom Sopwith, winner of the de-Forest cross channel flight, also used an eight. The British & Colonial Aeroplane Company of England is another concern who evidently found this type superior even to the Gnome, as they are equipping most of their latest planes with the eight-cylinder type.

In addition to the above famous aviators who are using this design of engine, one notes the successful achievements of such well-known amateurs as Wilcox, Miss Todd and others.

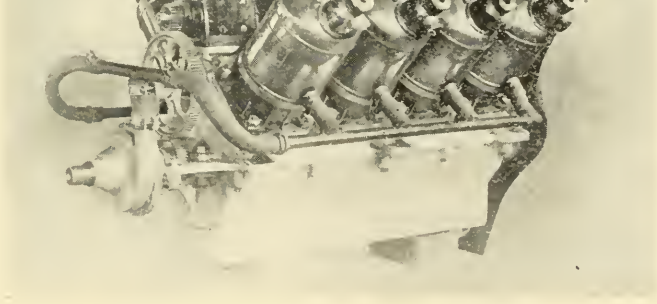
Even to the uninitiated in the art of mechanical design, the new eight-cylinder Rinek engines appear a beautiful piece of mechanism, the weight especially having been reduced to a point where they feel it would not be safe to go any lower. The Rinek Company are fortunate in occupying a unique position as engine builders at the present time, inasmuch as the experience they have gained through their exhaustive experimenting and refining has enabled them to produce a type of engine which America should well be proud of. Outside of the Curtiss Manufacturing Company, located at Hammondsport, the Rinek Company, we believe, was the first to go into the building of light-weight engines for aviation purposes, so one can see they have been in the field for an appreciable amount of time.

The new engines are all fitted with larger bearings throughout, which in itself increases the wearing life enormously. The new water jackets have been dubbed by the Rinek Company as being of a floating type, i. e., the jacket is not fastened permanently to the cylinder, but by an ingenious process is constructed in such a manner that it is at once easily accessible and at the same time entirely eliminates the possibility of leaking through the expansion of the cylinder being greater than that of the jacket.

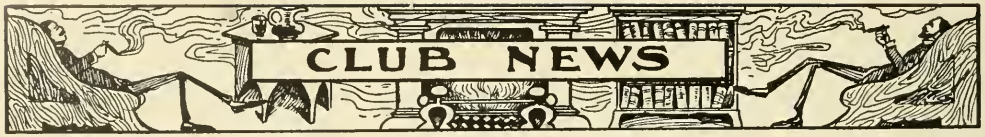
By this design of jacket it is possible at any time to get at the cylinder proper, as it is only a couple minutes' work to detach the jacket from the said cylinder. Lubrication is now taken care of by both force feed and splash, insuring at all times a positive amount of oil to all working parts. Outside of the above refinements, the general excellence of detail of these engines, we believe, is too well known to permit of further description.

"Our prospects for the coming year," said a representative of the Rinek Company recently, "would indicate sales to a surprisingly large number of professional aviators as well as amateurs, who have heretofore been flying with other makes of engines.

"Their adoption of the eight-cylinder 'V' as developed by the Rinek Company convincingly proves their acknowledgment of the superiority of these engines over all other types. Ultimately a Rinek is the invariable enthusiastic report of all Rinek users."



The New 8-Cylinder 55-60-H.P. Rinek.



A Model Aeroplane Club is being organized in Chicago by D. J. Goff, 4156 Calumet Avenue. He is anxious to hear from all those in Chicago who are interested in order that an organization meeting may be held and officers elected. This note is printed in order to bring the matter to the attention of those enthusiasts residing in Chicago and surrounding neighborhood. Mr. Goff requests that those interested communicate with him.

The Aero Club of Dayton and the **International Acroplane Club of Dayton** are moving toward consolidation. The Aero Club of Dayton will have an exhibit at the local automobile show February 13-18, amongst which will be one of the new model Wright machines. Headquarters will be maintained during the show and a membership campaign inaugurated. Aviation grounds and sheds have been obtained near the city and monthly balloon and aeroplane meetings are anticipated during the summer.

The Aeronautic Alumni Association has taken in a number of new members, comprising the men who have completed the 1910 course in aeronautics at the West Side Y. M. C. A. (New York). The association is now composed of graduates of the 1909 and 1910 classes. The following officers were elected: President, E. P. Hopkins; vice-president, O. J. Peterson; secretary, M. W. Ehrlich, and treasurer, Joseph A. L'Ibal. The association meets once a month at the Y. M. C. A., on West 57th Street.

The San Diego Aero Club was formed on Friday, January 13. The progressive citizens of San Diego were preparing for a two-day meet. D. C. Collier was arranging for Curtiss with two aviators to appear on the 28th and 29th of January.

The Aero Club of California had one of its members in San Diego in the person of Frank T. Searight. Mr. Searight and Mr. Collier conceived the idea of an aero club for San Diego. With characteristic energy Mr. Collier went to work and by the time the meet took place he had 155 members. On the day of the meet the membership of the club increased to 300.

This club aims to fit up the whole upper floor of a large office building for its home. D. C. Collier was elected president and L. G. Monroe secretary. H. LA V. TWINING.

The **Santa Clara Valley Aero Club,** San Jose, Cal., has been formed by a few practical aviators and enthusiasts.

They appealed to Joseph T. Brooks, secretary of the Chamber of Commerce, and found him enthusiastic on the subject, and through his efforts was organized a membership of fifty within a month. Nor were the members idle. Negotiations were immediately opened with the aviators in San Francisco at the time, and contracts were made with the birdmen for a Saturday and Sunday meet for San Jose. Mr. Radley proposed to fly to Mt. Hamilton and back, and also to run a five-mile race with a racing automobile as some of the special features. He reported the driving park the best he had seen, and the light, steady trade winds of this valley were most favorable for successful flights. Santa Clara Valley is practically free from high winds, and is attracting unusual attention from professional aviators on this account.

The club further proposes to give shows and promote meets, both amateur and professional, whenever possible. They are also going to try and get some balloon men there to make ascensions and hold balloon races. They have some enterprising men on the membership list, and the business men of San Jose have said they will stand by the club.

Santa Clara Valley has a first place in aviation, as Prof. J. J. Montgomery, the first vice-president, built the first heavier-than-air machine here and made his successful flights in San Joe about five years ago. The Schubert Aeroplane Manufacturing Company is building a new machine of an ingenious type to enter the trans-continental race. The directors are San Jose business men and they are figuring on building a factory in the near future.

The present headquarters of the club is in the Chamber of Commerce. The club has a file of aviation journals for the members and their friends. KATHERINE MAGNESON,
Corresponding Secretary.

The Aeronautical Society of the University of Illinois, Urbana, Ill., is carrying on active work in the form of lectures and experiments. Several good lectures have been heard from university professors, and one on "European Dirigibles," by Mr. Banck, of Chicago. Several talks have been given by students who have had practical experience with aeroplanes and light gas engines.

Two gliders have been designed and built and tests are being made of the materials and methods of construction. A number of experiments in aerodynamics are being started by the society. The shops and laboratories of the Engineering School offer excellent advantages for this work and some interesting results are hoped for. Those interested should address the secretary, Mr. R. Watts, 507 E. John Street, Champaign, Ill.

Williams Aeronautical Society, of Williams College, Williamstown, Mass., listened to an eloquent address by Hudson Maxim, delivered before that society on January 19th.

The Boys High School Aero Club, of the Boys High School, Brooklyn, N. Y., has been formed to promote interest in aviation in the high schools of Brooklyn and to develop models. At the first meeting of the club Alfred Hanson was elected president and Henry S. Piebes, 815 Avenue J, Brooklyn, secretary. At the first call over a hundred applications for membership were received. The members have arranged to give a course of lectures and to have in addition prominent men address the club.

A **Boys' Aero Club** has been formed in Minneapolis, Minn. The officers are: Merrill W. Seymour, president; Morris Kahn, treasurer; Filman Chase, secretary, 3047 Fifth Ave., S.

The newly formed **Aero Club of Connecticut** is going famously. A score of members are being taken in at every meeting. A bill is before the legislature on the subject of registration of aeroplanes in the state, and the club expects that every man jack will have been in the air literally, either by aeroplane or balloon, before the summer is over. This is the only club thus far that has even expressed such a praiseworthy ambition.

The New York Model Aero Club at the January election named the following Board of Governors for this rapidly growing organization: Hon. President—Edward Durant, President—Adrien Lacroix, First Vice-President—Louis F. Ragot, Second Vice-President—Ralph Barnaby, Secretary-Treasurer—A. Maas, Chairman of the Patent Bureau—Charles L. Ragot, Chairman of the Contest Committee—Edw. Durant.

A handsome silver plaquette, presented by Louis F. Ragot, First Vice-President, as a Lifting Power Trophy for models, will be contested for under the club auspices in a series of competitions during the year 1911.

The rules governing these contests have been formulated and published, and a public demonstration of the manner of conducting a

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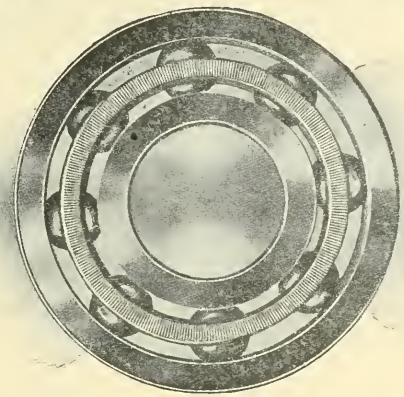

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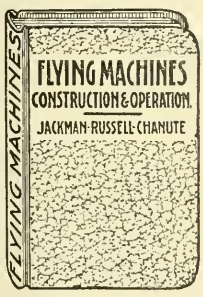

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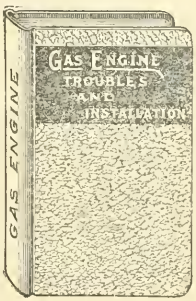

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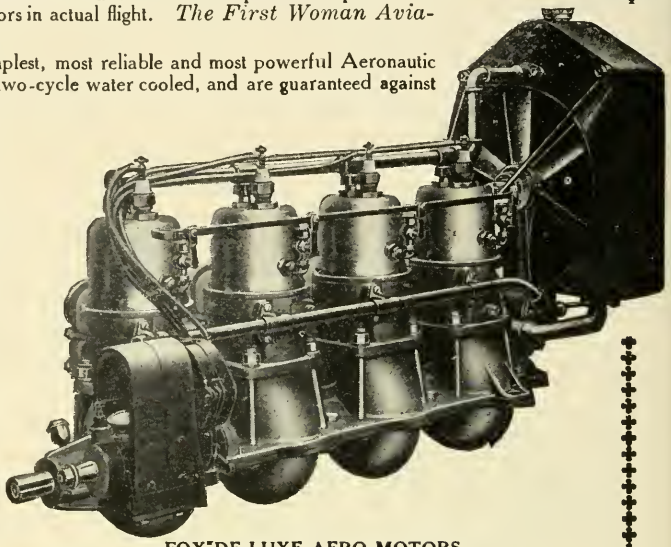

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Lifting Power competition under these rules will be given by members of the New York Model Aero Club at the Greek-American Athletic Club games at the 22d Regiment Armory, February 18, 1911.

The Aero Club of Cuba, Havana, was formed during the recent meet of the Curtiss aviators there.

The Aeronautical Society, at its regular semi-monthly meeting held January 26, continued its resume of the accomplishments of 1910, with a view to determining the most hopeful directions to incite development and improvement, and Mr. G. F. Campbell Wood, Secretary of the Aero Club of America, gave a most able address, illustrated by stereopticon views. Mr. Wood's knowledge and experience was devoted to referring mainly to the unusual achievements which have not been noticed generally in the press of this country.

Dr. Julian P. Thomas advanced a novel and interesting theory to account for the recent accidents on the ground of momentary unconsciousness. He claims that our brain is divided in pairs through the center of the cranium and as an idea of thought moves from one side to the other a slight instant of time is occupied during which there is what he calls the momentary unconsciousness, and it is during this moment that the fatal move can be made which results in an accident causing death. To apply a remedy, he recommends that aeroplanes should be so constructed that they will maintain the momentary equilibrium in all directions long enough for the mind to resume normal power over the members, both hands and feet, and does not believe automatic stability is advisable, because that is bound to eliminate the manual control, but momentary stability will accomplish the desired end in so far as his theory is concerned. He added, however, that the deaths of Johnson and Hoxsey, as well as Chavez, which occurred upon the descent from great altitudes, may have been occasioned by mountain sickness which unfitted these martyrs to the cause, and was not due to the theory of momentary unconsciousness.

Mr. C. H. Godley took the view that we should not try to seek radically new devices, as some people hold, but should be amply satisfied with the progress made during the past year with the present style of aeroplanes and should endeavor to perfect what we have without departing from the general construction. He felt that speed being a great desideratum during flight, but not during starting or landing, that an effort should be made to perfect methods of reefing surfaces so as to have a greater surface when starting and landing than when in full flight.

Leo Stevens and Aviator Hilliard were present. Mr. Stevens spoke of his flights he had made with Mr. Hilliard and discussed Dr. Thomas' theory with reference to ballooning.

At the meeting February 9 President Hudson Maxim very lucidly described the effect of high explosives in view of the Communipaw disaster of the week prior, which was produced by 10,000 pounds of gun powder and an equal amount of dynamite blowing up and sinking a tugboat. The newspaper comments and legislation to prevent such a recurrence made this a very timely address, particularly in its relation to aeroplanes. The expansion of high explosives is approximately 2,500 times its volume and travels at the rate of 1,100 feet per second, losing force in the ratio of the square of the distance. An aeroplane more than 100 feet away from such an explosion would probably not be effected, and Mr. Maxim gave as his opinion that to effectually attack flying machines shrapnel fired at the rate of eight per minute in automatically range finding guns would have more effect than the firing of high explosives in the expectation of injury to the aeroplane from the concussion of explosions.

Mr. James H. Hare, correspondent and photographer for "Collier's Weekly," gave an interesting account, illustrated by stereopticon views, of his experiences in the Russo-Japanese war, showing where flying machines would have been of immense benefit. And upon his return from this war he was sent to Kitty Hawk, N. C., to determine, if possible, whether the Wright Brothers were actually making practical flights, which was somewhat doubted by the press in the North owing to the secrecy. His illustrations showed the difficulties of reaching the lonely spot the Wright Brothers had selected, requiring a walk of 6 miles in the sand dunes, where mosquitoes and ticks are rife, and hiding under the cover of trees to obtain a view of the flying operations without being seen, as the aeroplane was not brought out when any strangers were about. Mr. Hare succeeded in obtaining three photographs showing flights conclusively, one of which was with a passenger.

Senator James F. Duhamel described an entirely new construction of motor with no reciprocating parts, the piston consisting of a rotating body with flange against which the pressure acts, and the inlet and outlet is performed by valves of rotary construction. geared by ingenious means to the main rotary piston. The casing is all stationary and the model of the construction was demonstrated by compressed air, as it was not practical in the meeting rooms to have gasoline or steam, the invention being applicable to either power. The inventor is Mr. John Norin, 695 Franklin avenue, Brooklyn, N. Y., and it is thought that this motor will be heard from when developed commercially.

The **Aeronautic League of New Jersey,** Union Hill, N. J., held its annual meeting on February 7 in Gathmann's Hall, Union Hill, when the following officers were elected: Cornelius De Bernardi, president; Charles Remond, vice-president; W. A. Kraus, secretary; L. Liverani, financial secretary, and John E. Ring, treasurer. The above officers were appointed as a technical committee.

Models of various kinds of flying machines were exhibited and their good and bad points were discussed at considerable length. Most of the officers and many of the members have had practical experience as birdmen, and at the present time three of the members have almost completed the construction of machines of their own. They stated that just as soon as the weather permits two of them expect to be ready to fly.

The next meeting of the league is scheduled for Feb. 21, when the special feature will be a review of aviation from the inception of the science up to the present time.

After the meeting adjourned the members enjoyed a supper, after which pleasant things were said as to the outlook for the coming season, when several of the members expect to leave this earth, for a short time at least. Seven members are building machines.

Waco, Tex., Jan. 21-23.—The Moisant International Aviators flew. High wind prevented flying the first day, although Audemars and Hamilton both prepared to fly, and desisted only when it was seen that to leave the ground meant practically certain death. On Jan. 22, with a wind said to be 45 miles an hour, Simon made a 24-minute flight, the only one of the day. On the following afternoon Simon made two flights, and Garros, Barrier, Audemars and Hamilton one each.

Oklahoma City, Okla., Jan. 14-18.—Moisant International Aviators. Barrier, Simon and Garros stars, Barrier flying cross-country twice in a 15-minute flight.

Temple, Tex., Jan. 25-26.—The International Aviators gave a successful two-day show. Hamilton was one of the features here, and Garros' three flights being particular remarkable for their daring. Barrier flew across the city for 18 minutes in a 35-mile wind.

Houston, Tex., Jan. 27-31.—Moisant International Aviators. Simon and Garros astonished Houston with their manoeuvers, both swooping and curving, narrowly grazing automobiles, people and buildings, until the spectators were afraid he would strike them. Waving his hand, they would dart away again. Simon chased a herd of cattle in a nearby field and created a roar of laughter. Both flew over the city, a distance of almost six miles from the field. Barrier flew to an altitude of 5,600 ft. Garros', Simon's and Barrier's flights lasted from 10 to 24 minutes.

TWO MORE AIRMEN KILLED.

DOUAL, Feb. 9.—Two more names were added to the death roll of the aeroplane.

The aviators Noel and Delatorre were killed while conducting a trial of a military aeroplane before experts from the War Department, previous to its delivery to the army. Noel was the pilot and Delatorre a passenger.

According to the requirements of the department, Noel tested the machine for an hour, and the trial, which was considered in every way successful, was practically at aa end. The aviators were gliding down from a height of about 250 feet, when suddenly the wings folded up and the machine fell headlong to the earth.

This makes the present death roll of the power machine number thirty-five, not forty-two, as reported elsewhere.

GERMAN AIRMAN KILLED.

BERLIN, Feb. 6.—Lieut. Stein of the German Military Aviation Service was instantly killed while making a flight over the military aviation field at Doberitz to-day. The aeroplane dropped from a height of 65 feet. The Lieutenant's skull was crushed.

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PATENT LIST.

William F. Sullivan, Mt. Vernon, Ohio, 976,312, Nov. 22, 1910. Filed Sept. 13, 1909. AUTOMATIC BALANCING MECHANISM FOR FLYING MACHINES. Pendulum system, weighted swinging frame, actuates valves admitting compressed air or similar agency to move piston and levers controlling aeroplane surfaces.

Francois Lebreil, Villeurbanne, and Raoul Desgeorge, Lyon, France, 976,582, Nov. 22, 1910. Filed Nov. 17, 1909. AEROPLANE. Improved monoplane, bicycle chassis, low center of gravity for lateral stability, shifting seat, fore and aft control, concave sustaining surfaces curved downward, with greatest dimension of plane in longitudinal direction.

Herman Thaden, Atlanta, Ga., 976,709, Nov. 22, 1910. Filed Nov. 20, 1909. AIRSHIP. Multiple following surface monoplane, with feathering movement of propellers tending to propel and lift.

John Holmes Wilson, Middlesex Township, Cumberland Co., Pa., 976,765, Nov. 22, 1910. Filed May 26, 1909. FLYING MACHINE. Double monoplane, diamond frame, vertical rudders, fore and aft, produce twisting effect in connection with control mechanism.

Thaddeus S. Harris, Modesto, Ill., 976,873, Nov. 29, 1910. Filed March 30, 1909. AIRSHIP. Helicopter. Shifting weight of passengers to control direction.

Louis Adolphe Hayot, Beauvais, France, 976,876, Nov. 29, 1910. Filed Aug. 31, 1909. AEROPLANE. Automatic equilibrium by dihedral wings jointed at the shoulder, moving forward and back in a horizontal plane.

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FOR SALE—50-H.P. Harriman motor, complete, Schebler carburettor, $100 high-tension magneto. Everything new. Has been run only once this month. Is being sold by the Harriman people for $1,675. My price $900 cash. Address Harriman, care AERONAUTICS. (P)

AVIATOR, licensed pilot Aero Club of France, long experienced in flying, just arrived from Paris with his genuine Bleriot monoplane, wants Flying Exhibition contracts. Don't reply unless you have something real good. AVIATOR, 51 West 84th St., New York.

MOTOR FOR SALE—100-horsepower Emerson aero motor. Has not been run 4 hours. In perfect condition. Price, $1,000. Address Motor, care AERONAUTICS. (C)

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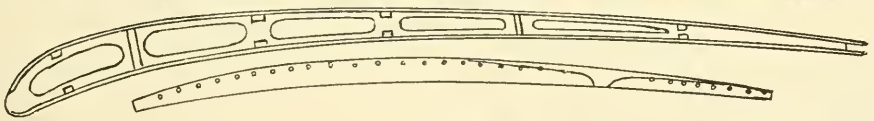

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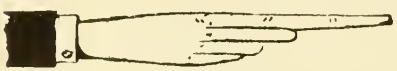

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AERIAL MARKET PLACE

Rex Smith Aeroplanes Made Commercially.

The recent issues of "Aeronautics" have contained interesting accounts of the flights of the Rex Smith aeroplane.

Hitherto unheard of as a designer of aeroplanes, Mr. Smith and his assistants have quietly pursued their work of developing the commercial aeroplane. Freedom from accident and great facility of control have been marked evidences of the success of these early performances. Three novices have flown the machine with perfect ease and demonstrated the value of the strength and simplicity of the apparatus.

The company claims for the machine a range of flying speed between 25 and 65 m. p. h. This machine is only an experiment and in no way comparable with the next development, which embodies the results of the valuable data obtained from the months of actual flying with the number two machine. The policy of the company is to establish a permanent business of a high character and nothing has moved Mr. Smith to abandon his original decision, i. e., develop a machine which no competition can embarrass.

This farsighted policy is obviously a good one, and no phase of the business future has been overlooked. The offices of the company are in Washington, D. C., in a modern office building, owned by the president of the firm. College Park, Washington's best flying grounds, is but a few minutes distant either by train or trolley. The coming activity of the government, the Aeronautical Reserve, and the National Aviation Co., all located at College Park, made it of additional advantage. The company is in possession of the famous charter rights granted by act of the Maryland legislature to the American Aero Exhibition Co., of College Park, Md., which charter gives the company control of all flying exhibitions and contest privileges. This charter is very valuable, as College Park is a tremendous flying ground with every advantage to the national capital.

Mr. Smith, vice-president of the company, is a patent lawyer of twenty-nine years' practice, and Victor J. Evans, the president, is the head of one of the largest firms of patent attorneys in the country. Associated with these gentlemen is a strong coterie of patent experts. No phase of the patent end of Mr. Smith's machine has been overlooked, and applications have already been allowed that will prove of great value to the company.

The company is incorporated with a capitalization of $500,000.

Goodrich Window Display.

A window display that is proving very interesting to the public has just been installed at the headquarters of the B. F. Goodrich Company, in New York City, at 1780-1782 Broadway. It represents the tapping of rubber trees in the Para regions of South America and making the crude into biscuits at a natives' camp.

The transcontinental trip of A. L. Westgard recently, covering 4,600 miles over the deserts and mountains of the western country, is a monument to the rubber tire industry and the Goodrich in particular. Two of the tires of a 4,400 pound car had New York air in them when San Francisco was reached.

Clarke's Flyers.

We have received from T. W. K. Clarke & Co., High Street, Kingston-on-Thames, England, two sample models and their catalogue of materials for model making. England has thousands of boys and men flying models in competition, and in this respect, at least, are "way ahead" of America. Gears, thrust bearings, struts, air-cooled engines, strut connections, gold beaters' skin, bearings, and a hundred other supplies, all in miniature for models, are listed.

One model of which a feature is made has flown 900 feet.

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The danger of losing tires has been reduced to almost nothing by the recent perfection of the Goodyear wing detachable aeroplane tire. It is absolutely impossible for a Goodyear tire to be torn from the rim. They are held to the rim in the vise-like grip of piano wire tape which is imbedded in the base of the tire. No matter at what angle the wheel strikes the ground it is impossible for the tire to come off so firmly it is held to the rim.

There is also little danger of puncturing these tires when they abruptly strike the ground. They are made with an extra tough tread that prevents punctures. They have the greatest possible resiliency, which makes landing a comparatively easy matter.

These tires are used and indorsed by the best aviators of the day, including Capt. Thomas Baldwin, Clifford B. Harmon, Charles K. Hamilton, J. J. Frisbie, Harkness, Wilcox and other American and foreign aviators.

The Goodyear tires are made to fit the rims on Farman and Bleriot and other foreign and American-made machines.

Goodrich shock absorbers, of high-grade Para rubber, can now be had in both the Farman and Bleriot types. These are not carried in stock, but are made to order, because of the great variety of sizes. Goodrich shock absorbers are being used by the Wright Company, the Burgess Company and Curtiss, Dr. William Greene and the United States Signal Corps.

The Church Aeroplane Company's new Curtiss type 'plane will be at the Boston Show, fitted with the new 6-cylinder Kirkham motor.

INCORPORATIONS

Hempstead Plains Aviation Co., Garden City, L. I., $50,000. Incorporators: Alfred J. Moisant, A. E. Wupperman, Gage E. Tarbell, Allen W. Evarts and Chas. S. Butler Tarbell and Evarts are officers of a local land company which owns some of the Hempstead Plains.

Brooks Aeroplane Co., Saginaw, Mich., $5,000.

Rex Smith Aeroplane Co., Washington, D. C., $500,000.

Meteoric Aeroplane Co., of New York City, with a capital of $10,000. There are nine directors, among whom is Louis A. Leavelle, 213 West 53d street, New York City.

Kansas City Aviation Training School, Kansas City, Mo., $2,000. Henry J. Rahe, G. S. Bennett, C. H. Rahe and M. C. Bennett.

Andrew Smith, of Traverse City, Mich., is to form an engine company [illegible] $100,000 stock to build engines of his [illegible] Street.

Chicago Aeroplane Co. A. H. and W. H. Barrows and W. L. Wilson.

The W. I. Swain Shows, of New Orleans, are gathering together a group of aviators to be known as the "National Aviators." Among those already signed is J. J. Frisbie. R. O. Rubel, Jr., & Co., of Louisville, Ky., are supplying a "Gray Eagle" Curtiss-type biplane equipped with an "Aeromotor," made by the Detroit Aeronautic Construction Co. Perhaps Forepaugh and the other big circuses will be the next in line.

We Always Said So, but Some Didn't Believe It ::

¶ "I would rather have a page in your large publication than some space with you and some in two or three other publications. I sincerely believe that you have the only real publication in the field. For solid editorial matter and for worth-while circulation and advertising return, I am sure you don't have to take your hat off to anybody—and this statement is based on results we have received."

—Advertising Manager of one of the largest advertisers in the automobile accessory field and, of course, an advertiser in "AERONAUTICS."

Feb. 7, 1911.

¶ "I have had my advertising Patented for some time now and find that I get more replies from *'Aeronautics'* than from any other two magazines."

—Another Advertiser, Feb. 11, 1911.

AERONAUTICS

250 West 54th Street

New York City

CABLE: AERONAUTIC, NEW YORK
'PHONE 4833 COLUMBUS
PUBLISHED BY
AERONAUTICS PRESS, INC.
A. V. JONES, Pres't — — E. L. JONES, Treas'r-Sec'y
SUBSCRIPTION RATES
UNITED STATES, $3.00 FOREIGN, $3.50
ADVERTISING REPRESENTATIVES:
E. F. INGRAHAM ADV. CO., 116 NASSAU ST., NEW YORK
GIL RANKIN, 5 PARK SQUARE, BOSTON, MASS.

No. 44 MARCH, 1911 Vol. 8, No. 3

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¶ AERONAUTICS is issued on the 20th of each month All copy must be received by the 10th. Advertising pages close on the 15th. :: :: :: :: :: ::

¶ Make all checks or money orders free of exchange and payable to AERONAUTICS. Do not send currency. No foreign stamps accepted. :: :: ::

WHAT THE AERO CLUB MIGHT DO.

In a recent issue of "The Philadelphia Inquirer," Birdman, the aeronautic expert of that newspaper, whose editorial comments are closely scanned by aeroists all over the country, made some pointed suggestions to the Aero Club of America. Brief excerpts from Birdman's article follows:

"As the Aero Club of America is showing signs of increasing activity, it may be in order to suggest that it shall organize competitions for the purpose of encouraging inventors and for a study of mechanical possibilities. Take, for instance, the matter of aeroplane engines. No official body has ever made a test of aeroplane engines in competition in this country.

"Why not duplicate here the Alexander prize contest that was held in England recently? As the engine is the heart of the aeroplane problem it would be a valuable project to organize various competitions in this country, in order to bring out new ideas and stimulate the activity of the aeroplane engine producers.

"Competitive prize contests for automatic stabilizing devices would be another very desirable project for the Aero Club to take hold of.

"New ideas! That is the slogan that should be adopted by the Aero Club of America. Organize contests, offer prizes, get ingenious minds together in competition! Throw open the doors wide enough to let the delegates from the foolish ward come in, rather than keep out a single man who has the merest germ of a practical idea. Don't be afraid of the cranks. Lilienthal, Langley and Chanute were cranks in their time, and Chanute was the only one of the three who lasted long enough to live down the reputation and hear the knockers change their tune.

"All of which (to turn off the steam heat right here, before we get too warm), is respectfully submitted to that coterie of gentlemen in little old New York, the Aero Club leaders, who are giving freely of their time and money for the advancement of aeronautics, and who may—mind you, I say 'may'—know as much about it all as does Birdman."

HALL-SCOTT

Cable Address "SIGNANY" San Francisco
WESTERN UNION TELEGRAPHIC CODE

Hotel St. Francis
San Francisco

September 20, 1910

Hall-Scott Motor Car Company,
San Francisco, California.

tlemen:-

After a thorough inspection and test of one of r 8-cylinder V-shape aviation motors at your factory, I convinced that you have the best aviation motor built America.

Kindly express the motor I ordered to Sacramento soon as possible.

Yours very truly,

Charles K. Hamilton

Motor Car Company

Manufacturers of

Complete Aviation Power Plants

¶ Motors, propellers and radiators built within our own factory, allowing of correct balancing of component parts, and a corresponding maximum degree of reliability and efficiency. ¶ An American-built motor, used and endorsed by professional aviators as well as novices.

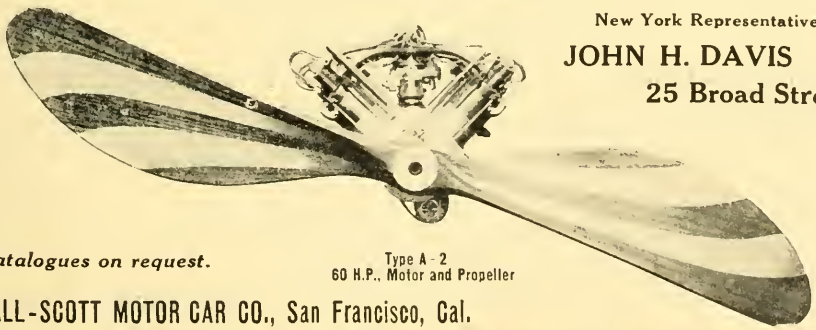
CHAS. K. HAMILTON
Aviators of America

J. J. FRISBIE
Aviators of America

DIDIER MASSON
Los Angeles Times flight, 80 miles cross country and directly over Los Angeles.

Capt. THOS. S. BALDWIN
Baldwin Aviation Co. Motor shipped to Hong Kong, China.

FRED. J. WISEMANN
Most successful novice at San Francisco Meet.



Type A - 2
60 H.P., Motor and Propeller

New York Representative

JOHN H. DAVIS
25 Broad Street

Catalogues on request.

HALL-SCOTT MOTOR CAR CO., San Francisco, Cal.

Our Balloons Made Good

IN THE

National Race, Indianapolis, Sept. 17th, 1910

RESULT: Two Balloons in the International Race, St. Louis, October 17th, 1910. The Only American Made Balloons in this Contest—which proves that we are the Leading Balloon Manufacturers in America—look at our past records.

Largest in America—testing with Air

CHICAGO—9 Competitors—Won both Distance and Endurance trophies by a big margin.
INDIANAPOLIS—6 Competitors, 1st and 3rd prizes.
PEORIA—3 Competitors, 1st Prize.
ST. LOUIS—9 Competitors, 1st, 2nd and 4th Money.

CAN YOU BEAT THAT!

How we do it: by using the very best material in the country; building on safe, practical lines, with good workmanship.

AIRSHIPS—AEROPLANES—INSTRUMENTS

FRENCH AMERICAN BALLOON CO.

H. E. HONEYWELL, Director

4460 Chouteau Avenue, St. Louis, U. S. A.

Vol. VIII, No. 4. APRIL, 1911 Serial No. 45

AERONAUTICS

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SINGLE NUMBERS 25 CENTS

A Sample Letter—Why Experiment?

Mineola, L. I., February 28th, 1911.

ELBRIDGE ENGINE COMPANY,
Rochester, N. Y.

Attention Mr. DeLong.

Gentlemen:-

I have watched your engine which Frank Paine used here and feel sure if you have a 4-cylinder 1910 "Featherweight" engine you can ship us immediately at a fair price, I can make good with it.

Mr. T——— had a talk with Mr. DeLong last year and he made him a proposition which Mr. T——— did not accept at that time, but if you have a second-hand engine at this time send us your terms as soon as possible.

I have been using a ——— motor in the T——— plane but recently after a half-mile flight this motor went entirely to pieces, leaving us with a number of bookings we cannot fill without power.

Our machine was taken as a model and her measurements used by Mr. Gill in his continued article on "How to Build a Curtiss Biplane".

Hoping to hear from you by return mail, I am,

Yours truly,

The motor used by Mr. Paine, we are informed, was one originally sold to a professional aviator and seized for debts when he was hired to fly with another engine. It has been lying around Mineola for nearly five months, without attention, but was ready to fly when called on. "American Amateur Aviation" free for the asking.

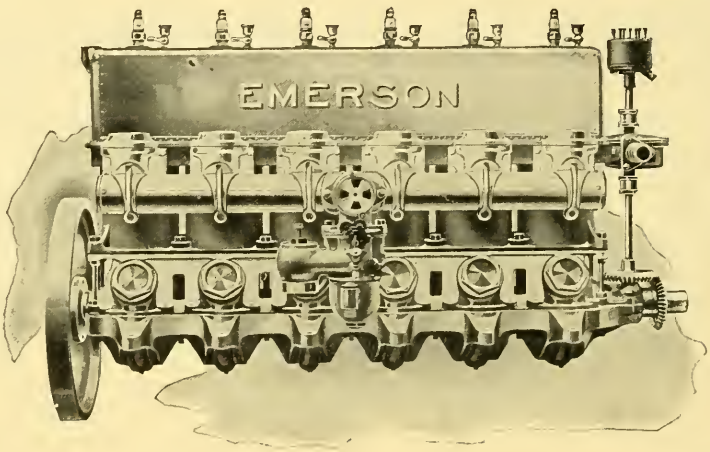
ELBRIDGE ENGINE COMPANY
10 Culver Road, Rochester, N. Y.

Gibson Propellers ∴ ∴ El Arco Radiators

DON'T BE DISAPPOINTED

but get enough power to fly and not "cut grass"

¶ Profit by the experiences of others. The Engine that stands up to the work and is the "last word" in engine building. :: :: :: :: :: ::



OVER 100 FLIGHTS BY

ANTONY JANNUS and REX SMITH at Washington, D. C., without a single accident. A record unequalled by the best of flyers.

Be "Wise" and get our Information

The Emerson Engine Co., Inc.

ALEXANDRIA, VA., U.S.A.

New York Office: 1737 Broadway
(Buick Building)

J. R. Westerfield — Telephone 782 Columbus

Grahame-White Biplanes

CONVERTIBLE TYPE FOR ONE OR FOR TWO PASSENGERS

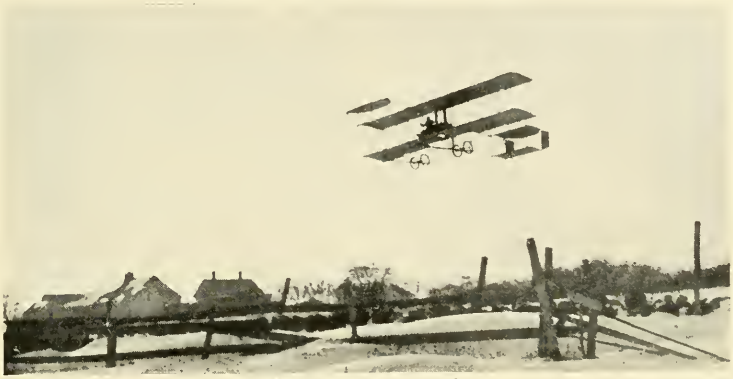
RELIABLE—FAST :: Built to the exacting requirements of MR. C. GRAHAME-WHITE

By BURGESS COMPANY AND CURTIS, Marblehead, Mass.

BURGESS BIPLANES

(Licensed under the Wright patents)

Single-passenger models B and C



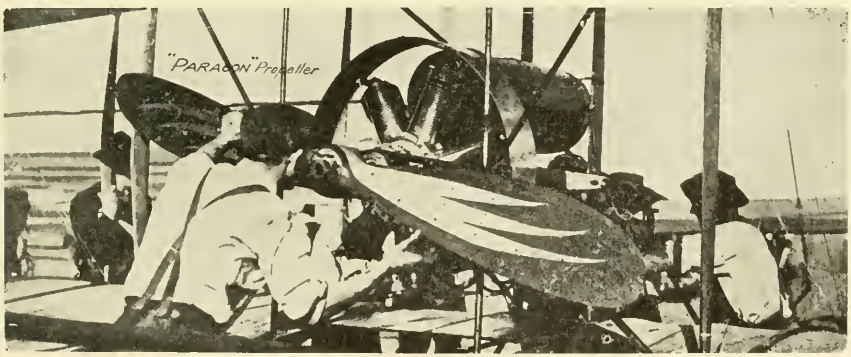
MODEL D IN FLIGHT

Two-passenger model D

Two Striking Endorsements: ¶ Mr. C. Grahame-White's first order was for SEVEN Biplanes designed and built by us. ¶ The Wright Company, on account of the excellence of our construction, invited us to become the first manufacturers in America licensed to build aeroplanes under their patents.

Burgess Company and Curtis Marblehead, Mass.

PARAGON PROPELLERS WIN



Reduced facsimile of very large photograph presented to us by Mr. Chas. F. Willard. Taken at the start of his great Los Angeles-Pasadena flight. He wires us that this 7-ft. 9-in. propeller gives 390 lbs. thrust at 1,100 r. p. m. on his Gnome engine.

Using a Paragon propeller Mr. Glenn Curtiss won the great speed contest at Los Angeles, defeating Radley (Bleriot), Ely (Curtiss), Parmelee (Wright) and Latham (Antoinette.)

We ***guarantee*** satisfaction and better thrust than any other propeller of equal pitch and diameter.

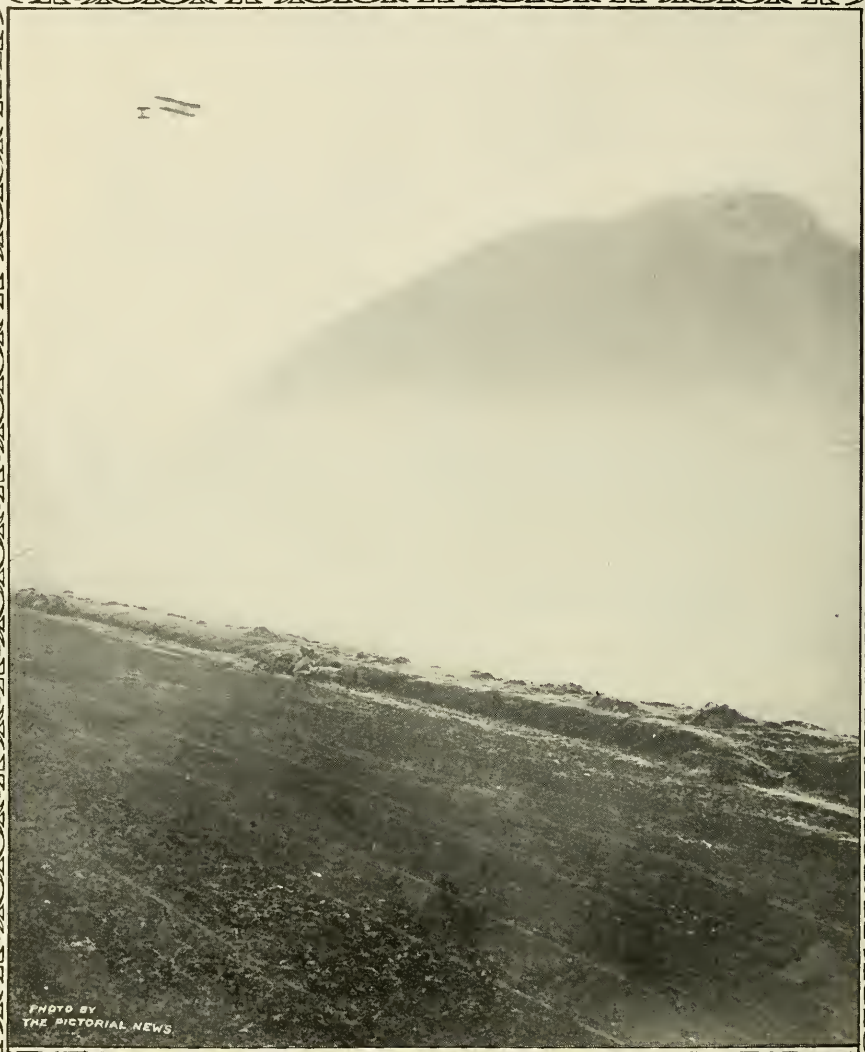
We will send you price list and a printed form for information about your machine so we can advise you just what propeller to use.

Here are some of the figures as our customers report them:

Willard, 7¾ feet diameter, 5.70 feet pitch, 390 lbs. thrust at 1100 r. p. m. Curtiss, regular, 7 feet diameter, 5.65 feet pitch, 360 lbs. thrust at 1200 r. p. m. Curtiss, racing, 7½ feet diameter, 7.00 feet pitch, 420 lbs. thrust at 1000 r. p. m. Smith, regular, 9 feet diameter, 5.92 feet pitch, 560 lbs. thrust at 1000 r. p. m. Smith, racing, 8 feet diameter, 8.60 feet pitch, 360 lbs. thrust at 700 r. p. m.

AMERICAN PROPELLER COMPANY - WASHINGTON, D. C.

Makers of the Celebrated Paragon Propellers



EUGENE RENAUX ARRIVING AT PUY-DE-DÔME

WINNING MICHELIN GRAND PRIZE ($20,000) FOR A FLIGHT

WITH PASSENGER FROM PARIS, 217 MILES, MARCH-7-1911

OF COURSE HE USED A BOSCH MAGNETO.

A TRANSCONTINENTAL AERO WAY

By Morris Wm. Ehrlich.

SECRETARY, AERONAUTIC ALUMNI ASSOCIATION, W. S. Y. M. C. A.

THE rapid development in the art of aviation may no doubt be attributed partially to the generosity of some of the wealthy men and newspapers, who in the way of monetary offers, have lent encouragement to the bird-man. It is a well-established fact, however, that the investment in air-craft for any special occasion or competition and the expense incurred by maintenance and otherwise, especially in long distance flights, comes somewhere near balancing the amount of the prize offered, and sometimes the expenditure may exceed the sum won.

To encourage cross country flying in America, William Randolph Hearst, of the "New York American," some time ago offered a prize of $50,000 for a coast-to-coast flight. The achievement of such flight would no doubt still further aid in establishing the aeroplane as a practical vehicle of conveyance.

The rules governing the transcontinental flight of about 3,000 miles, leaves the choice of a route to the discretion of the aviator, though the start must be made either at New York City or Boston, and the finish at Los Angeles or San Francisco, or vice versa, from West to East, with a landing at Chicago. The entire distance must be covered within 30 consecutive days and the aeroplane may be repaired as found necessary, but the contestant must use the same machine until the goal is reached.

The amount offered by Mr. Hearst will no doubt be increased considerably by the contributions of some of the local newspapers along the line of flight and by independent parties.

Many noteworthy performances have been accomplished both here and abroad by cross country fliers who rely either upon maps or upon their knowledge of the topography and surroundings of the country. But the late John B. Moisant, known the world over for his cross-country feats, flew from London to Paris, territory wholly unknown to him, by the sole guidance of a compass. In his many other flights in the United States and abroad he has demonstrated the feasibility of the reliance upon the direction of a compass in passing over foreign territory.

For those contemplating the trip across the United States via aeroplane, a general cross section of the country is given in the accompanying diagram, on which is shown the general aero way described below. The nomenclature represents the following:

N. Y.—New York City; A. M.—Appalachian Mountains; C.—Chicago; R.—Mississippi River; M. V.—Mississippi Valley; G. P.—Great Plains; R. M.—Rocky Mountains; G. I. B.—Great Interior Basin; S. N.—Sierra Nevada; S. F.—San Francisco. The dotted line represents the line of flying altitude of the aero way. To this are added the various altitudes of the different clouds, shown with their respective names, abbreviated thusly: S.—stratus; N.—nimbus; Cu.—Cumulus; S. C.—Stratus-cumulo; while A. and P. stand respectively for the Atlantic and Pacific Oceans. Another point is A. H.—marking the unofficial altitude record of the late Arch Hoxsey, amounting to approximately 11,500 feet.

The general physical divisions of the United States in order from East to West, arrange themselves in three sections and are:

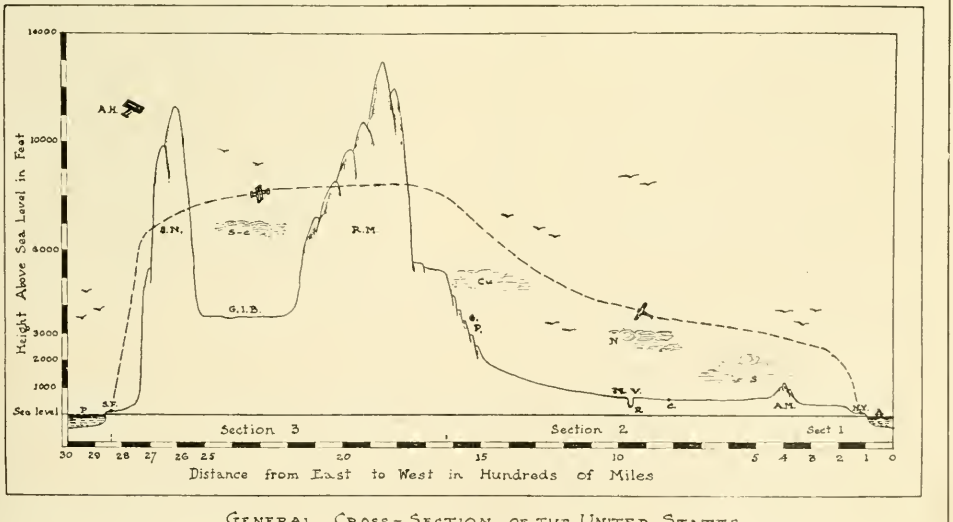
Section 1—The coastal plains and plateaus between the Atlantic Ocean and Appalachian Mountains.

Section 2—The extensive plains and plateaus from the Appalachians to the lofty range of the Rocky Mountains, and

Section 3—From the Rockies, covering the plateaus and the groups of mountain chains of the Western coast.

The air-line or course of the aero way outlined hereafter, is approximately in a direct line from New York City to Chicago, thence directly to San Francisco, or vice versa, from the West to the East, high above all dangerous obstacles. The aero way proper is, however, fundamentally based on the consideration of both the meteorological variations, as observed at the various stations of the U. S. Weather Bureau, and the physical divisions arranged in three general sections as named above.

Commencing the flight in the East, one should attain a general altitude of about 2,500 feet above the sea and pass over Section 1,



GENERAL CROSS-SECTION OF THE UNITED STATES
MORRIS WM. EHRLICH

Division	Elevation	Element	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept	Oct	Nov.	Dec.	Mean
SECTION 1 Atlantic Ocean to the Appalachian Mountains	Sea level	Temperature in Degrees Fahr.	30	24	41	45	55	65	72	69	66	50	42	36	54
	2500 ft		26	21	36	39	48	56	63	60	57	43	37	31	47
	Sea level	Wind Velocity in Miles per hour	10	10	10	10	9	8	7	7	7	9	10	10	9
	2500 ft.		20	20	20	20	18	16	14	14	14	18	20	20	18
	Pressure in lbs. per sq. foot		.50	.50	.50	.50	.45	.32	.25	.25	.25	.45	.50	.50	.46
	Direction of Wind		W	W	W	NW	W	SW	SW	S	SW	NW	SW	SW	SW
SECTION 2 Appalachian Mountains to the Rockies	Sea level	Temperature in Degrees Fahr.	26	26	42	41	53	66	73	70	63	49	38	30	48
	4000 ft		19	19	31	30	39	48	54	51	46	36	29	22	35
	Sea level	Wind Velocity in Miles per hour	11	12	14	16	11	10	9	9	10	12	12	12	11
	4000 ft.		25	27	32	36	25	22	20	20	22	27	27	27	25
	Pressure in lbs per sq foot		.61	.72	.98	1.28	.61	.50	.45	.45	.50	.72	.72	.72	.61
	Direction of Wind		NW	NW	SW	NW	SW	SW	SW	NE	SW	SW	NE	SW	SW
SECTION 3 Rocky Mountains to the Pacific Ocean	Sea level	Temperature in Degrees Fahr.	38	40	46	50	55	61	66	63	59	53	46	38	52
	7500 ft.		23	24	27	30	33	36	41	38	35	32	27	23	31
	Sea level	Wind Velocity in Miles per hour	9	8	10	10	9	8	8	8	7	7	7	8	8
	7500 ft.		23	20	25	25	23	20	20	20	17	17	17	20	20
	Pressure in lbs. per sq. foot		.45	.32	.50	.50	.45	.32	.32	.32	.25	.25	.25	.32	.32
	Direction of Wind		S	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW

MEAN MONTHLY VARIATIONS OF THE WEATHER IN THE U.S.

Morris William Ehrlich

at that height. This includes the low coastal plain extending west for about 40 miles and having a general elevation of 250 feet, and the plateau region adjoining, which is about 100 miles wide and rises to about 1,000 feet at its western boundary which meets the picturesque range known as the Appalachian Mountains. These narrow ridges are separated one from another by intervening trench-like lowlands, and extend for about 100 miles, joining the Mississippi Valley.

The mean temperature of this territory varies from 20 deg. F. in winter to 80 deg. in summer, having an annual mean at sea level of 54 deg., and the mean velocity of the prevailing wind blowing southwest, is 9 miles per hour. But at the flying altitude of 2,500 feet, the annual conditions will have varied thus: the temperature will be about 47 deg. with a corresponding wind velocity of about 18 miles per hour though the resultant or effective pressure will be equivalent to approximately .45 of a pound per square foot, for the atmospheric pressure will have decreased to 13.45 pounds per square inch.

Having crossed the Appalachian Mountains, one must gradually rise to a general altitude of 4,000 feet and cross Section 2 at that height. The territory to cover thus, is the Mississippi Valley and the Great Plains, which extends west for about 1,200 miles and then joins the Rocky Mountains.

Traveling towards the west over this region of grass-covered prairie plains, one must not forget to alight at Chicago, this being one of the requirements to fulfill the conditions. This brings one into the more pleasant plains of the lakes which rise above the water about 300 feet and have a general elevation above the sea level of 800 feet.

Continuing the flight above the unvaried patchwork of grass, one may notice the difference in the humidity of the surrounding atmosphere, though still high above the level, gradual rising land. The view, indeed, becomes most pleasing as the former monotony is broken by winding stream-formed valleys, and by the flourishing towns and villages, and the variety of hues offered by the different species of vegetation.

These lowlands gradually rise by insensible gradations and meet the barren highlands or plateaus of the Great Plains which in turn, again, rise to meet the Rocky Mountains at an elevation of about 5,500 feet.

The mean weather for this whole section varies slightly from that of Section 1, resulting in a mean annual temperature of 48 deg. F. at sea level with a corresponding wind blowing in a southwesterly direction at a velocity of 11 miles per hour. At the mean altitudes of flight of 4,000 feet the temperature will be about 35 deg. while the wind will be blowing at the rate of 25 miles per hour with an effective pressure per square foot of .61 pounds on account of the decrease in atmospheric pressure to 12.7 pounds per square inch.

The country remaining to be crossed now, Section 3, extends for about 1,200 miles to the Pacific Ocean and is the highest and most rugged portion of the United States.

Now, rising to a flying altifude of about 7,500 feet one must continue at this general height.

First, one meets the lofty range of the Rocky Mountains, having a general elevation of 6,000 feet, while the more prominent peaks rise to 10,000 feet and as high as 14,000 feet. In traveling by land, to cross these mountains, detours have to be made to get around them, while by traveling in the air, one may and should pass over, high above all obstacles. Having crossed the Rockies one now reaches the rugged region of plateaus, known as the Great Interior Basin, which has a general elevation of 3,500 feet. This desert-like region, with its dry climate is chiefly known by its "inland lakes," streams that do not reach the ocean. Continuing west, one now again faces the more lofty peaks of the Sierra Nevada range, which rises to a general elevation of 7,000 feet and as high as 12,000 feet. Having crossed these barriers of the coast one passes into the region known as the Valley of California, rapidly approaching the goal, San Francisco, which is seen in the distance.

In the Sky, Relaxing Fabric Means DANGER!

Dampness and cold above the earth causes shrinking of the wings of aeroplanes when built of plain, varnished or "treated" fabrics. This is followed by "stretching," which leaves the cloth flapping, cuts down speed and is the **DANGER SIGNAL!**

GOODYEAR fabric, the new **rubberized** aeroplane cloth, makes stretching and relaxation **ABSOLUTELY IMPOSSIBLE!** it is waterproof and cannot shrink and stretch when subjected to moisture and then dried.

Our rubberized cloth is the **lightest fabric** for its purpose in the world.

GOODYEAR

Rubber-Coated Aeroplane Fabric

This wonderful fabric's coating is permanent and constructed to last for many years. It is unaffected by heat or cold.

Its invention is the result of an exhaustive investigation by experts in France, England, Germany, Switzerland and America. We have constructed special machinery and a large, new building for the sole purpose of making the perfect aeroplane fabric. Our exclusive process is thorough in every particular.

Goodyear Aeroplane Fabrics have been adopted by The Wright Company, Burgess Company & Curtis, The Lovelace-Thompson Co., The Metz Co., The Detroit Aeroplane Co., and many other prominent manufacturers as well as aviators. These pioneers know what coverings are best.

Goodyear Aeroplane Fabric is the **SAFEST, LONGEST-WEARING** aeroplane cloth known to science.

Goodyear Aeroplane Tires are the choice of the world's greatest aviators—**THEY KNOW!**

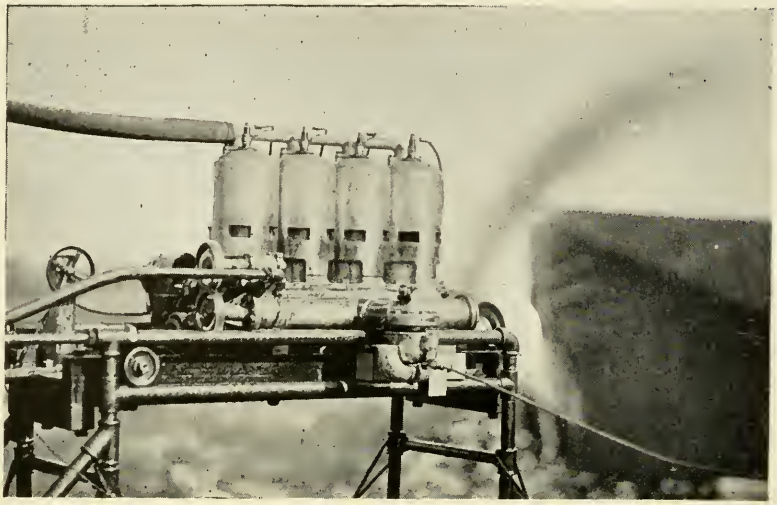
The Goodyear Tire & Rubber Company

Main Office and Factory, Ninety-fourth St., AKRON, OHIO

Branches and Agencies in All the Principal Cities

400 POUNDS THRUST with a Roberts 40-50 H. P. Aviation Motor

READ THE BROOKS LETTER BELOW



1-100 sec. exposure at 900 r.p.m. absence of blur shows freedom from vibration.

EXACT WEIGHT 170 lbs. complete (not stripped) EASY TO START, as spark is same, irrespective of advance, as the drive and not the circuit breaker is advanced.

Will run indefinitely without distress or overheating. Just the motor for sustained flight. The best evidence of Roberts Quality is the fact that Mr. Armstrong of the Brooks Aeroplane Company had the choice of the best foreign and American makes and selected the Roberts after trying several other well-known makes. The results of the test made under his personal supervision is given in the following letter:

BROOKS AEROPLANE COMPANY

TO WHOM IT MAY CONCERN:— Saginaw, Michigan, March 8th, 1911.

Representing the Brooks Aeroplane Co. of Saginaw, Mich., manufacturers of aeroplanes and desiring to purchase for them a high grade, efficient and trustworthy aeroplane motor, the undersigned arranged with the Roberts Motor Company, of Sandusky, Ohio, for a test under personal supervision and service conditions of one of their model 4-x aeroplane motors, and would certify to the following facts:

Mounted on testing stand, swinging a Paragon propeller 8' diameter and 5' pitch, the motor developed and maintained a thrust of 400# at 900 revolutions per minute, ran smoothly and without any trouble or diffiuulty of any kind for a period of five hours and showed no cause or reason why it could not have still continued this endurance test for another period of as many or more hours.

During this test the motor was continuously under my personal supervision and there were no adjustments nor attention required of any kind. All the conditions of the test were the same as if the motor had been mounted in an aeroplane, (except of course, that the motor was mounted on a testing stand), the cooling water being circulated through a honey-comb radiator by the pump of the motor itself. The motor ran perfectly cool, showed no signs of overheating, never back-fired, and at the end of the test was in as good condition as when the test began. The speed control was all that could be desired, the absolute freedom from back-firing and the special magneto spark advance allowing all changes of speed to be made without affecting the smooth running of the motor in the least. The motor started easily, is economical of fuel, lubricates perfectly and ran until the spark was cut off.

Upon the showing made, the motor was accepted, the motor being in fact more than satisfactory and more than fulfilling the claims made by the Roberts Motor Company.

The writer knows of no motor on the market today that combines the simplicity, power for weight, high grade of workmanship, ample strength of all working parts, and dependability, as does the Roberts Aeroplane Motor.

Yours very truly, BROOKS AEROPLANE COMPANY,
(Signed) E. R. Armstrong, Aviation Engineer.

Write today for catalogue and prices

The Roberts Motor Company, 1430 Columbus Avenue Sandusky, Ohio, U. S. A.

The hot and arid climate of this Western coastal region affects the mean annual conditions of the whole section thusly: from a temperature in the winter of 30 deg. to a summer condition of 75 deg. with an annual resultant of 52 deg. F. The corresponding velocity of the wind blowing in a northwesterly direction, amounts to about 8 miles per hour.

At the altitude of flight the temperature will decrease to about 31 deg. with a corresponding increase in wind velocity to 20 miles and a resultant effective pressure of about .32 pounds per square foot, because of the decrease in atmospheric pressure to 10.45 pounds per square inch.

Having briefly described the physical conditions in relation to the aero way and slightly touched upon the conditions of the weather, we will now examine the monthly meteorological variations given in the accompanying tabulation:

This table gives the mean temperature, wind velocity and its prevailing direction at sea level for each month of the year, together with the computed variations for the three consecutive sections, representing different elevations, with an added column of effective or resultant wind pressure.

This "effective" pressure is based on an assumed homogeneous atmospheric layer, because as the wind velocity increases with height, the atmospheric pressure decreases correspondingly.

With this data at hand, one may readily decide the month for commencing the flight. The trip should not take the form of a monstrous task, for by traveling at a mean rate of 50 miles per hour, and 2 hours per day, or an equivalent mean daily travel of 100 miles, the distance of 3,000 miles may be readily traversed in the period allowed, 30 days.

The aero-champion who will accomplish this trans-continental feat will gain immortal glory for himself and his machine and aid in finally silencing the critics who now consider the aeroplane a mere toy, by proving the practicability of the new and ideal vehicle which has now arrived and come to stay.

THE HYDRO-AEROPLANE

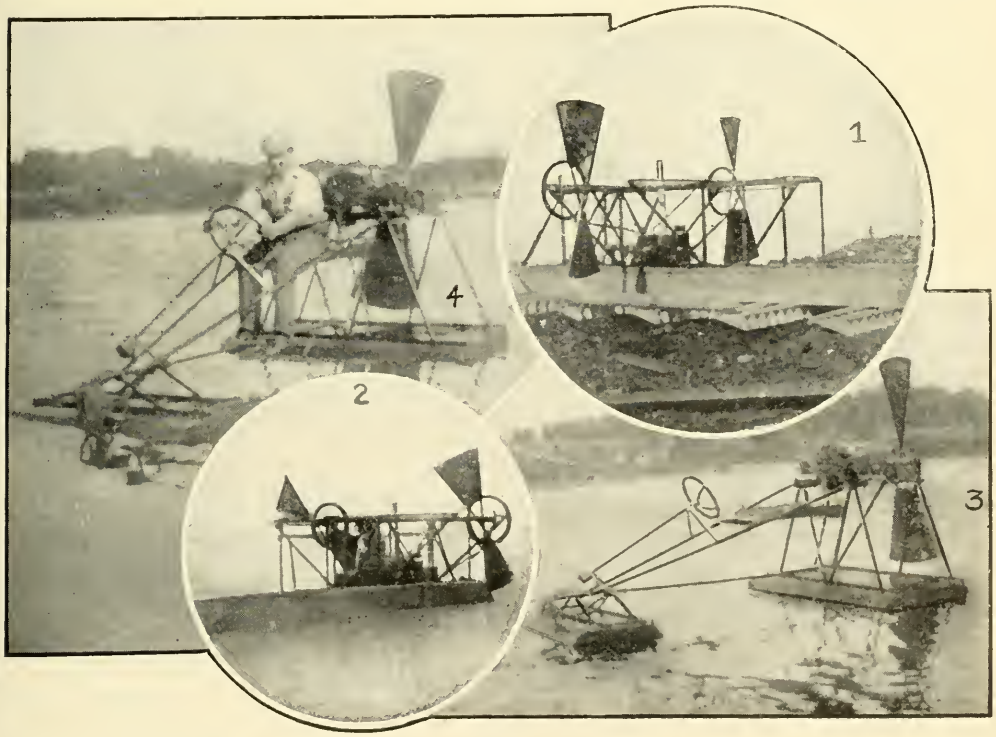
By W. R. Turnbull, M. E.

IN the "Scientific American" for Dec. 17, 1910, there is a description of a hydro-aeroplane that is most interesting.

In this connection, it may be of interest to describe two air-propelled hydroplanes, designed and built by the writer in the years 1906 and 1907.

At that time I built these machines as preliminary experiments for subsequent conversion into hydro-aeroplanes, but the only light weight engine I could obtain at that early date was a 16 h. p. "aeronautic motor" of two cylinders, built by Duryea at Reading, Pa., and this motor gave so much trouble and proved so unsatisfactory that the tests with the hydro-aeroplanes were never completed and for this reason the machines were not heretofore described.

Since the subject is again presented in Mr. Fabre's excellent design, it may be as well to publish my incomplete results in the hope that they may be suggestive to persons working along similar lines. Other things being equal, experimenting on and above water, has always



appealed to me as being the safest and most rational method for dynamic flying machines, until aerial navigation is a solved problem.

The machine built in 1906 is shown in Figures 1 and 2, and consisted of a scow-like boat-body with five double-curvature hydroplanes beneath, formed of sheet metal supported by wooden ribs, with transverse arms above the ribs attached to the bottom of the boat.

A light superstructure carried twin air-screws belted to the engine in the body of the boat. The hydroplanes were fully immersed but as the speed was increased it was supposed the body of the boat would lift above the water and the hydroplanes skim the surface. The cross-arms prevented this, and, besides, the air-screws were badly designed and the engine gave constant trouble, so nothing was obtained but a little experience.

The 1907 design was much simpler and better (See Figures 3 and 4). The boat body was entirely eliminated and the hydroplanes became also the floats; the forming ribs being completely enclosed in a water-tight sheet metal covering.

Depending on the amount of immersion the forward float could support weight up to 250 pounds and the rear, large, float up to 620 pounds when fully immersed. The weight of the whole machine with engine and operator was about 550 pounds.

The superstructure was of steel tubing and the forward float was pivoted on this and acted as a rudder (not very satisfactorily) through the steering wheel shown.

One 6-foot propeller was directly connected to the same Duryea engine, before used, and a 54 pound flywheel was also used but the torque of the engine was most uneven, causing constant trouble from sheared-off keys, broken propeller arms and the like. All the propellers used were made with steel tubing arms and hard-fibre blades and were in every way inferior to the wooden propellers of today.

The cross-section of the floats is shown in Figure 5, the dotted line being a dashboard, for waves, that was found necessary.

The constant trouble with engine and propellers, and also the low power of the engine, prevented any satisfactory results being obtained and the experiments were consequently abandoned.

With the long list before us of fatalities with aeroplanes that have occurred in 1910, it would seem well worth while to give great consideration to any combinations of

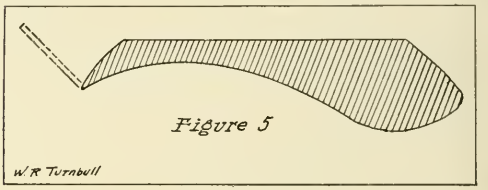


Figure 5

aeroplanes and hydroplanes that are sound from an engineering standpoint. The great problem of aerial navigation is by no means solved yet; our aviators are a race of "flying-men," who are constantly "breaking their wings," and who depend upon their own skill and mental ability to maintain equilibrium.

At present the man is a 70 per cent. factor and the machine is a 30 per cent. factor. Not until all this is reversed, and we have a dynamic flyer with automatic stability and in which the machine is the 70 per cent. factor will we be measureably in reach of the goal.

LIBERTY PRIZE WON, LOST, WON?

THE $10,000 prize offered for the fastest flight from Belmont Park around the Statue of Liberty and return was originally awarded the late John Moisant, who had the nerve to take a straight course over the houses of Brooklyn and who made the best time.

White officially, through the Royal Aero Club, protested the award to Moisant on the ground that the latter had not flown an hour during the meet as originally required by the rules. A special meeting of the International Aeronautic Federation was held January 10 in Paris and the matter was referred back to the Aero Club of America, sustaining White's protest.

The Aero Club of America held a meeting on March 14, and in view of the decision of the I. A. F., and in view of the fact that White had made a "foul" by not flying outside all the pylons in making the preliminary circuit of the course in starting for the Statue, announced its decision in favor of De Lesseps, the slowest man of the three who tried. The club could not stand back of its original ruling for fear of being ejected from the I. A. F.

Now White protests the award to De Lesseps.

THE POINT AT ISSUE ORIGINALLY.

During the meet the contest committee changed the rules to the effect that it was not necessary thereafter to make an hour's flight to qualify for competition for the Liberty prize. White, having been an "early bird," had already made his hour flight the first days of the meet so as to have that part "cinched." He immediately objected to the change, but the contest committee overruled him and he entered the contest, however, with full knowledge of the change in the rule, and he did not fly in the race "under protest." He apparently accepted the conditions in force at the time of the flight. He did not take the straightest course to the Statue with his 100-h.p. Bleriot and Moisant beat him with a 50-h.p. machine.

The judges also found the same evening, upon receiving the report of the pylon observers, that White flew inside one of the pylons in making his start, sufficient to disqualify him on that score.

Other changes in rules were made from time to time during the meet, all of which changes were accepted. If the contest committee had the right to make one change, it had the right to make another, one might say. But there must always be something upon which to hinge a loser's protest.

De Lesseps himself made no hour flight according to official records, though one of his flights did last an hour.

By his barograph record, and from other information, he undoubtedly was in the air more than an hour on one occasion. On the records, however, he got credit for but 47 minutes. Under the system used, certain hours were set apart for, for instance, duration flights. Any time employed in flying before or after this hour went for nothing so far as counting toward the total accumulated duration figures in the division of prize money. But in granting the Statue race to De Lesseps the Aero Club took into consideration the true time flown by De Lesseps, irrespective of the system used during the Belmont for counting time. And still they say "consistency is a virtue."

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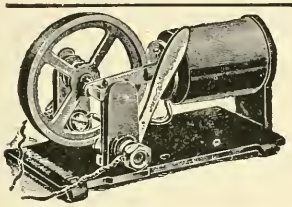

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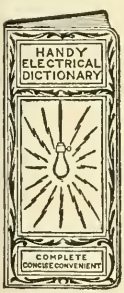

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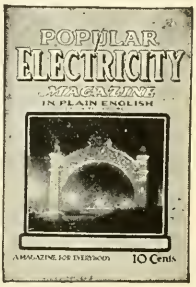

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Captain Thomas S. Baldwin

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NEW YORK

WHAT OUR AEROPLANE BUILDERS NEED

THE present day finds aeroplanes in flight all over the world, and the idea of flight getting a strong hold on the popular imagination. Much has been written about how to fly, about the dangers of flight, and about the profits of individual aviators. There remains much which bears upon the rearing of a substantial industry concerning which few of us have given heed. The spectator at a flying exhibition usually has one of two sensations, either the hair-raising thrill at the daring tricks of a too reckless operator, or the feeling of how easy and simple it all is. These two attitudes are revealed in the expressions one hears at the flying exhibitions.

Those who do not want to go up with the first aviator they see are loud in their condemnation of the art as too dangerous. Of course, there is a middle ground, but the casual observer does not often consider it. In the same way aviators seem to be divided into two types. Those who have never been frightened consider flying safe and the present machines creditable pieces of engineering. The late John B. Moisant was one of these who was not frightened until it was too late. His article, "The Gentle Art of Flying," published in a popular magazine, is a gruesome verification of the existence of this idea. The more thoughtful, and none the less brave, aviators look at the hundreds of machines flying about the country, and shudder at the thought of flying in more than one or two in every hundred. Fortunately, those flying in the death traps suffer very few accidents. This craze for flight has started many incompetent people building aeroplanes. The patent office is full of the inventions of those who have never flown and who know less than nothing about the problems which their devices purport to solve. An enormous demand for aero motors has been created and many very poor products have been advertised and sold to an innocent public. Forty-nine out of every fifty of these motors never fly, either on account of the aeroplane, the inexperienced owner, or because the motor fails to deliver its rated horsepower.

Professor Langley, of the Smithsonian Institution, is usually conceded to have been one of the greatest minds ever engaged in the solution of problems of mechanical flight. He seems to have been the most thorough in his experiments and certainly was eminently qualified to probe the unknown. He and those subsequently engaged in proving flight possible realized that the motive power was the most important factor in the make-up of a motor-bird. Professor Montgomery, of Santa Clara, Cal., another scientist with Langley's thoroughness and insight, believes sustained flight possible without much power. His attempts to simulate the soaring buzzard have met with wonderful success, but still leave the records for sustained flight in favor of the motor-bird. The Wright brothers, after proving the air capable of sustaining the weight of a motor, found the motor problem their worst one. Octave Chanute was handicapped in many of his desires by the inability to secure suitable motive power. Bleriot had only moderate success until he found the Gnome motor. The designer of the Antoinette monoplane found it necessary to develop a motor and his success has attended the experiment. Glenn H. Curtiss' success is to be attributed primarily to his skill as a gas engine designer and operator.

In the early days of the automobile, the noisy, unreliable engine of only four horsepower was sufficient, and people enjoyed automobiling then, many thinking the desired had been accomplished and that the clumsy little rattle-traps were a great invention. The design of those early automobiles was very blind to good engineering. Most of them were poor jobs of carriage building, with a very crude motor attached. The condition of the carriage building trade at that time was very little behind what it is to-day and there was no excuse for such atrocious body designs as were perpetrated in the name of the automobile. How different the present thirty to sixty horsepower car with its refinements and conveniences and excess power enough to negotiate any hill or road with ease? This refinement has not come from learning how to build better carriages or do better upholstery, but from the increased life and service of the motor—the improvement that has changed the auto from an occasional plaything to a daily necessity.

Aeroplane building is following in the wake of the automobile, and already is more attractive as a sport. Unless the public is more discerning in its demands, the progress in the development of the aeroplane will be as slow as with the automobile. To be sure, the automobile grew at a tremendous rate, but the aeroplane should profit by the lessons taught. There is no good reason for building aeroplanes with wood work on them that would make any conscientious carpenter blush with shame, with metal work that any good ornamental iron worker could improve by 50 per cent., and with covering of which no upholsterer or sail maker would be guilty. The haste to get to flying and win the large prizes offered for various flights has been provocative of these things, and as a result, most of the prizes have been premiums on daring, rather than substantial recognitions of scientific or engineering ability applied to aeroplanes.

The money prize as a premium on daring is a detriment to the growth of a substantial industry. The public wants aeroplanes built with the same engineering intelligence that is applied to roads, ships, bridges and present-day automobiles. The sooner the crude little aeroplanes, built by adventurers, are replaced by the production of skilful and thorough designers, the better chance this country will have to lead the world in aeronautics. It should be possible for us to profit by the experience of the past and avoid great waste of money and effort on worthless productions.

The aeroplane was made possible by the gasoline engine, and the increasing radius of aeroplane possibilities seems to depend on the improvement of the engine. All the experiments of the scientists led to one conclusion. As soon as men were able to fly, no experiments proved so valuable as those in flight, and the knowledge gained was accurate and startling. The necessary requirements in weight, surface and power for certain conditions in flight are fast becoming absolute quantities. Greater horsepower, less weight, greater strength, less fuel consumption, and, above all, reliability, are the demands on future aero engines. Except in the few instances where aeroplane builders have been their own engine builders, there has been no money prize offered the engine manufacturer. Owing to the great cost of developing a new motor, the manufacturer has been content to offer what the "innocent public" would buy, and as those first in the field found themselves without competition, scores of these soon-to-be-obsolete and always-unreliable motors were sold. The public has no protection in this engine question. There is no tribunal or engineering board with the authority to rate aero engines so that purchasers can know what they are getting. Manufacturers of gas engines would soon feel the effect of such a board and some uniformity of rating would result. Many engine builders would suffer materially, whereas others would receive just recognition of their wares.

There are those building engines and those building aeroplanes who are keenly aware of the conditions as they exist and are producing their best, and these builders will eventually get the recognition that comes to him who

(Continued on page 154)

STOP! LOOK!! LISTEN!!!

THOMAS A. EDISON once said that the storage battery was the greatest invention ever brought out to develop man's latent capacity for lying. It strikes us that the storage battery has "nothing on" the aeroplane.

The future aerial battleships and transports, monster freight carriers and speed demons, conceived in a frenzy of imagination and protected in the Patent Office at Washington, are as numberless as the sands of the sea. The satisfaction of having produced the world's greatest aerial invention is boundless—until it is to be exploited. Of these we have no criticism. Everyone is entitled to his own ideas. If one wants to patent a broom for sweeping water, that is his privilege.

But when stock in these freaks of fancy is put on the market to be sold to gullible enthusiasts whose knowledge of the art is nil, or to easy-marks attracted by the wonderful prospects of the on-paper flying machines, it is time that clubs and other organized bodies make some effort to call a halt. Usually the inventor actually believes in his achievement. This is an example of what might be called a "virtuous fraud."

Then there is the "intentional fraud," the fake pure and simple. The inventor, who is often his own promoter, is not necessarily a believer in his claims. He must have a patent as stock in trade.

An elaborate office is opened in some big office building, half-page stories with vivid word and pen pictures of an aerial monstrosity appear in sensational newspapers; perhaps great advertisements call blatant attention to the latest marvel. "Sucker lists" are circularized, and for a year or so the promoter is in clover.

Perhaps there is even a large sized model which is shown to the more discerning and wide-awake prospects. A motor is started, there is a flapping of wings and the heavy model slowly rises to the ceiling—while a balance weight does the trick, more or less concealed from view. This demonstration usually lands the most obstinate. This is the true aero faker, unembarrassed by belief in his invention.

There is still another class, the commercial parasite which lives on the legitimate enterprises by advertising similar wares at ridiculous prices, or by exaggeration and misrepresentation. This animal proposes to sell Curtiss or Bleriot aeroplanes, say, without motor and all ready to put together, at one-tenth the price of a bona fide machine. He does not always remember to say that his parts are copied, nor that there may be considerable expense in the important matter of fitting the parts. When the prospect gets really interested the seller plainly states, though not in writing, that his stock was actually made in the Curtiss factory. He actually knows nothing about the business and will agree to sell motors at a price known to all "in the game" to be impossible. He can't fulfill his word; yet he goes merrily on, asking why one should pay $5,000 for a real machine when one can buy the parts for a song. Why buy a Bleriot from Bleriot when this trimmer will sell you one at half the price or less?

His advertisements mention great sums offered in prizes, which no one but he has heard of. They put earnings of aviators up to twenty thousand dollars a week. This is misleading, to say the least. Fifty thousand has been won in a few hours. No aviator can regularly make such a sum. That's even more than an aeronautic editor gets.

This class is perhaps only half bunco. One might really get the set of parts for a copy of a machine.

For the sake of the original maker of the machine copied, in behalf of the later concerns who openly and clearly advertise they sell parts for the copied aeroplane, for the protection of the public whose interest is so easily attracted toward this new industry, warning must be given of these "fly-by nights."

To the maker of parts who truthfully puts his claims we do not object. That is a matter between the original maker and the parts man.

Beware of the visionary and the perpetual motion flyer, the plain bunco man, and the misleading advertiser whose money is not accepted by the best aeronautical journals.

Willard's Flight Around the Dome of the Capitol Building at Sacramento, Calif., on Feb. 4, in Course of Exhibition Flying with Eugene Ely.

The WRIGHT FLYER

The aeroplane that has proven itself to be safe, practical and always ready. The only machine built to accommodate two people comfortably. Holder of the World's Record for Slow Flying, Quick Turn and Accuracy of Landing; and American Record for Long Distance Cross Country Flights, Duration, Distance and Altitude.

At the recent Harvard-Boston Meet at Atlantic, the Wright Flyer, in competition with Bleriot, Farman, Curtiss and other machines, took first prize in duration, distance, altitude, accuracy of landing, slow flight and the Hammond Cup for bomb throwing.

Planes, propellers and motors built entirely in our own factory. Write us for terms and delivery date.

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This picture shows part of the factory of the Greene Company, Rochester, N. Y., and some of the

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It is a motor that can be depended on to stay up and keep going as long as the fuel lasts.

Two cycle; 4½" bore and stroke; 2, 3, 4, or 6 cylindered.

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Handsome beyond expression, resembling solid silver. Stronger than Iron or Steel alone. Very light, being Aluminum, and no factor of safety slighted. Gives more pounds pull per pound in weight than any other motor in the world.

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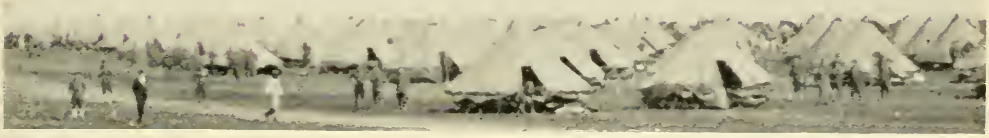
FARMELEE AND FOULOIS MAKE GREAT RECORD



Parmelee and Foulois at San Antonio.

FLYING the new and finely finished Model B Wright Flyer, loaned the Signal Corps recently by Robert J. Collier, 106 miles over new and uninhabited territory from Laredo, Tex., to Eagle Pass, Tex., one of the three railroad points of entry into Mexico, on March 3, P. O. Parmelee and Lt. B. D. Foulois established two new American records at one and the same time.

This distance is greater than has ever been flown before across country in America. The weight lifted, 1,400 lbs. in all, is greater than has been carried any distance in the States previously. The weight additional to that of the machine totals more than 70 per cent. of the weight of the machine itself.

This distance was traveled in 2 hours 10 minutes, to be accurate—and accuracy is one feature in AERONAUTICS—a mean speed of 48.9 m. p. h. An average altitude of 1,200 feet was maintained.

NO PLACE TO LAND FOR CENTURY OF MILES.

For the first four miles landings might have been made, but there was no landing place for the remaining 102 miles, save in the Rio Grande River. The machine carried 20 gallons of gas, an extra gallon of oil, tools, maps, compass, barometer and field glasses.

WIRELESS ON RETURN TRIP.

On the return trip on March 7, the machine carried 1,450 lbs., including a wireless set. Owing to trouble with the engine it was necessary to descend about half an hour after the start, but the only damage done was in removing the machine from the water of the Rio Grande River, where a "landing was made." The wireless set worked satisfactorily and messages from the aeroplane were picked up by wireless stations between Eagle Pass and Laredo. En route to Eagle Pass the course was laid out and plotted with map and compass, the country on both sides of the Rio Grande was studied, and messages were dropped to the detachments of United States troops in the vicinity over which they passed.

Beginning the end of February many flights were made by Parmelee and Foulois at Fort Sam Houston, near San Antonio, where the United States Army has recently been mobilized, and a number of Signal Corps men took their first rides. Here the Collier machine was given its introduction to the air and pronounced fit.

MACHINES BOUGHT BY GOVERNMENT.

One Wright and one Curtiss have been ordered to report at San Antonio. It is likely the old Wright, first bought by the Signal Corps, will be devoted to teaching and the new machines for active service.

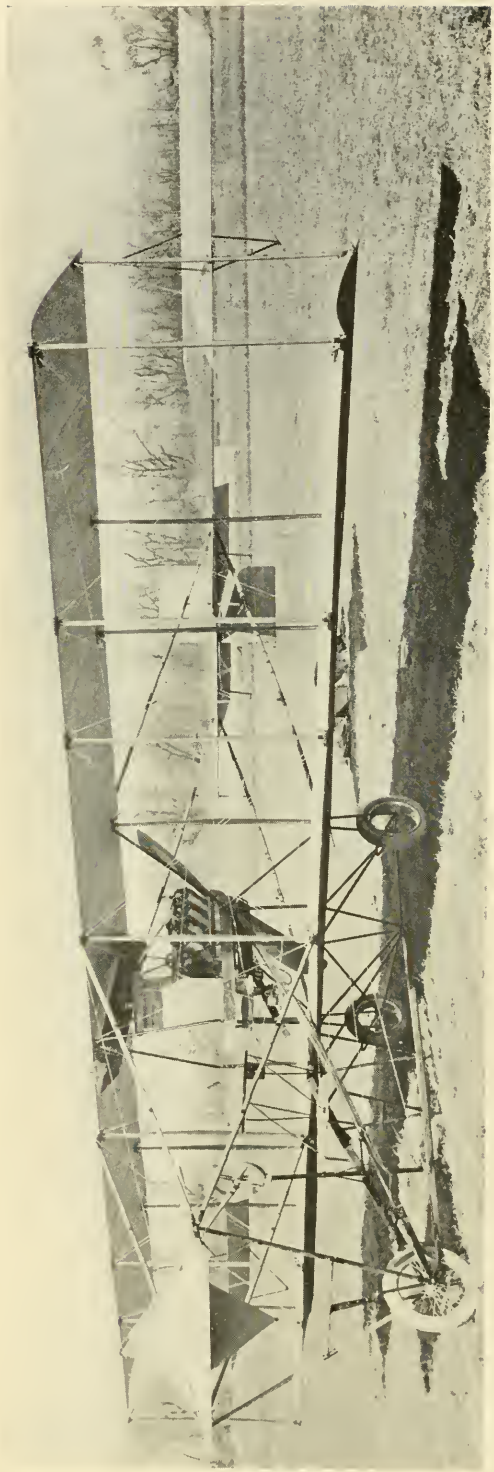
Parmelee was obtained from the Wright Company for the purpose of making these flights in Texas and will return to the service of the company.

New Model Wright.

It is rumored on good authority that the Wright Company will soon have on the market another model, a sort of "gentleman's raceabout." This will be smaller than the Model B, the regular two-man machine, and larger than the "Baby Wright," which is really for racing and altitude work. This new machine will be for the operator alone. The power plant will be "more efficient" and it will have greater climbing speed and speed on the level than the standard model.

Details are not available at the time of going to press on either this subject or that of the proposed flight from Chicago to New York, which, if accomplished, will constitute the world's greatest event to date in aeronautics.

SAN ANTONIO, Tex., March 16.—Lieut. Foulois and P. O. Parmelee again demonstrated the value of the aeroplane as a means of communication for military purposes by taking a message to Maj. George O. Squier, U. S. Signal Corps, from Gen. Carter. The flight was made from San Antonio to Leon Springs, a distance of about 26 miles, each way, and return. The total time consumed was 1 hour 45 minutes.



Curtiss IV. (Military)

McCURDY FLIES MILITARY CURTISS.

On March 17, before a distinguished group of army officials and members of the Diplomatic Corps in Washington, D. C., J. A. D. McCurdy gave two exhibition flights over the Potomac in the Curtiss war machine, which will be sent to the Texas-Mexican border line for use by the United States Army encamped there.

This is the first of the "Type IV" or "military" machines produced by G. H. Curtiss, and is the first Curtiss machine to be bought by the Army. It is the same in all respects save size as the Type III brought out in California (see March issue). One feature of this type is its ability to "knock down" in small sections for transportation. Each section of the planes is interchangeable. The engine is the usual one, 51.2 h.p., 8 cylinders. Equipment includes Bosch ignition and El Arco radiator.

McCurdy started from an open tract of ground several hundred yards east of the bandstand on the Speedway. The machine had been sent to the starting point early in the morning, and McCurdy rose into the air for his first flight at 9.25 o'clock. He was in the air 10 minutes. He circled the Speedway and the open country for a mile on the Virginia side of the Potomac ten or twelve times. In making one round of the imaginary track he followed the river down stream for 3 miles ,and came back the same way, alighting gracefully and without mishap within a few yards of where the machine had arisen.

CURTISS MILITARY IV.

The new machine sent to San Antonio, after the flights at Washington, is just a little larger than the standard Curtiss, which is 26 ft. 3 in. by 4½ ft. for main planes. A small section, interchangeable, is inserted between the two larger sections on each side. The passenger sits directly behind the pilot. Supporting surface, 280 sq. ft.; weight, 700 lbs.; motor, Curtiss, 8-cylinder water-cooled, 4 by 4, 51.2 h.p.; Bosch magneto, Schebler carburettor, El Arco radiator, Pennsylvania 20 by 4 wheels.

NATIONAL GUARD OF CALIFORNIA HAS AERONAUTICAL SQUAD.

An Aeronautical Squad, in the Coast Artillery Corps, National Guard of California, was organized February 20, 1911, by Lieut. J. McHenry, Jr., under Col. Geo. A. Schastey, Chief of Artillery, N. G. C.

A detachment of thirty-two men and two officers are to be enlisted, all being expert men in their various branches, such as mechanics, wireless operators, engineers, photographers, topographers, etc. They are receiving the personal support of Glenn H. Curtiss, Lieut. Walker, Robinson and Willard of the Curtiss camp and other well-known aeronautical and army men. Eugene B. Ely was first man to enlist. They have already purchased one Curtiss machine and expect to have a second within a month. Mr. Curtiss has undertaken to train two of the men detailed for actual flying.

It is intended to carry on experiments in wireless telegraphy, bomb dropping, aerial photography, and in fact all branches of aero scouting.

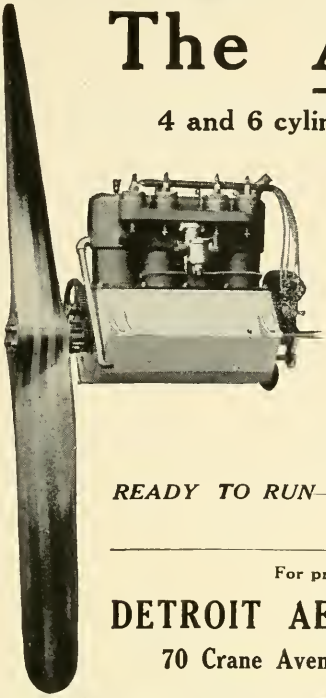
Col. George A. Schastey is lending every assistance to the organization and it has been heartily indorsed by the Governor and Adjutant-General.

Flying practice will not be attempted at first, the squad will take up the theory of aeroplanes, gas engines, etc., and their management at the San Francisco Armory, where the first machine will be assembled, before out of door practice and demonstration. Drills and flying practice will take place in the vicinity of San Francisco, and it is certain that by the time of the summer maneuvers the squad will be drilled, equipped and in every way a most important branch of the National Guard.

CLEVE T. SHAFFER.

The AEROMOTOR

4 and 6 cylinders——4 cycle——30 to 75 H. P.



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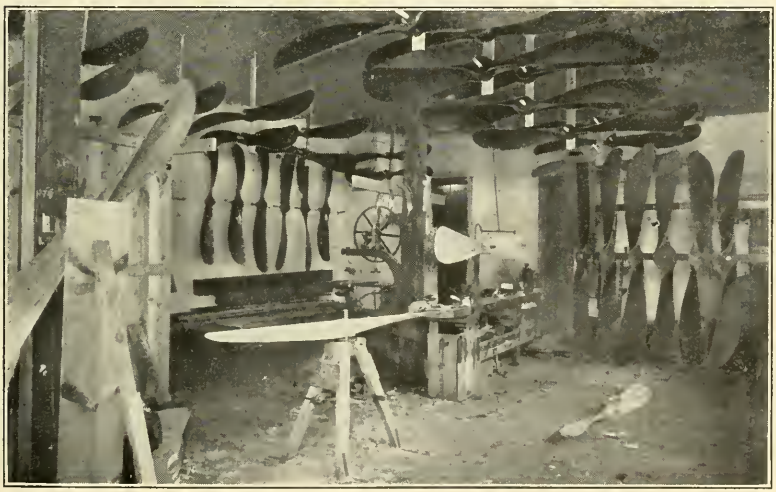

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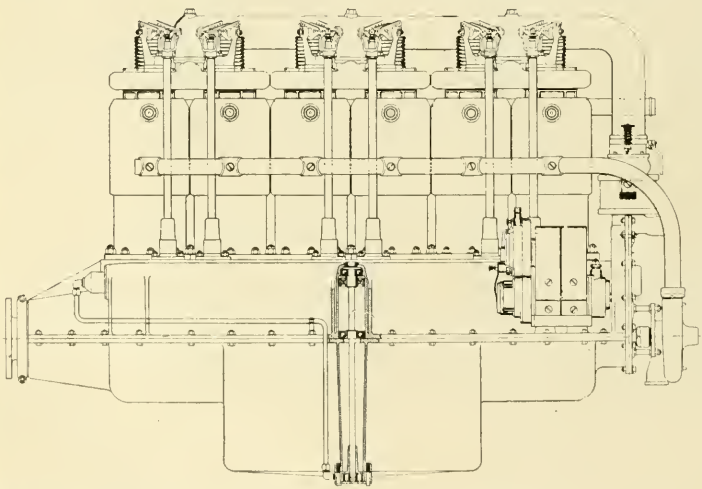

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FLIGHT PROGRESS ABOUT THE COUNTRY

IN LOS ANGELES' VICINITY.

By Prof. H. La V. Twining.

GLENN CURTISS has improved upon his pupil Ely's flight to and from a prepared platform on a government war vessel, looking at the feat from a naval standpoint, by rising from the water, landing alongside the vessel, being hoisted aboard without damage and then, after being lowered to the sea again, flying back to his starting point, North Island, in San Diego (Cal.) Bay. This was accomplished on February 17th, while the last issue was on the press.

The test was made to demonstrate that his "hydro-aeroplane" does not make necessary any structure upon a ship's deck.

In this flight the front elevator was discarded, the engine reversed so as to put the propeller in front of the biplane, and Curtiss sat back of the planes. The blast of air from the propeller interfered with vision and in later flights a return was made with the usual arrangement.

Since the first details were published in the last issue of AERONAUTICS, Curtiss has made many flights and experiments with the water and air craft. In one, he flew the machine with a third surface added.

ALIGHTS ON LAND AND SEA.

A flight of several miles was made the end of February, starting from the water, alighting on land, starting on land and alighting again in water. Wheels have been added to the apparatus so that Curtiss can start from either land or water, if the latter is smooth.

These wheels can be drawn up out of the water when starting from the water. It is apparent that the ability to do this would be desirable. Curtiss has worked out some devices which may be patentable and he is desirous that no details be given out.

The figures in the March number on Curtiss' pontoons are correct. The latest one shown in the picture is his latest. It is the same shape, but is narrower. His last one is 2 ft. wide, about 12 ft. long and 13 in. deep at its thickest point.

I was at San Diego and saw Curtiss fly off the water. The machine rests gracefully on the water on an even keel. When the propeller is started it skims rapidly along the surface of the water, throwing a slight spray as the pontoon cuts through the water. When sufficient speed is attained, it rises as easily from the water as it does from the land.

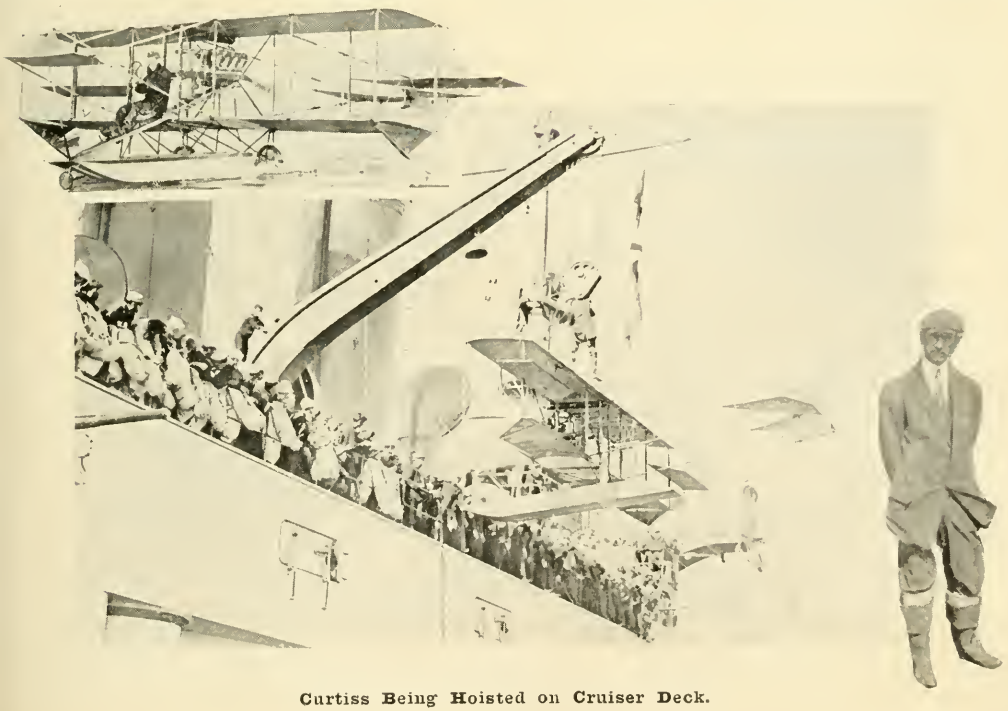
HUNTING VIA AEROPLANE.

Harkness, on February 17, pounced down on a jackrabbit with his Antoinette and cut him in two with the propeller. This is a new kind of a hawk. Harkness intended to fly that afternoon, but the encounter with the rabbit smashed his propeller and put him out of commission. This is the second time an aeroplane has been used here for running down game, although in this case it was accidental. Latham, before the meet last December, went duck hunting at the Bolsa Chica Gun Club grounds. He left Lominguez and flew to the grounds. Here he chased the ducks and shot one from his aeroplane.

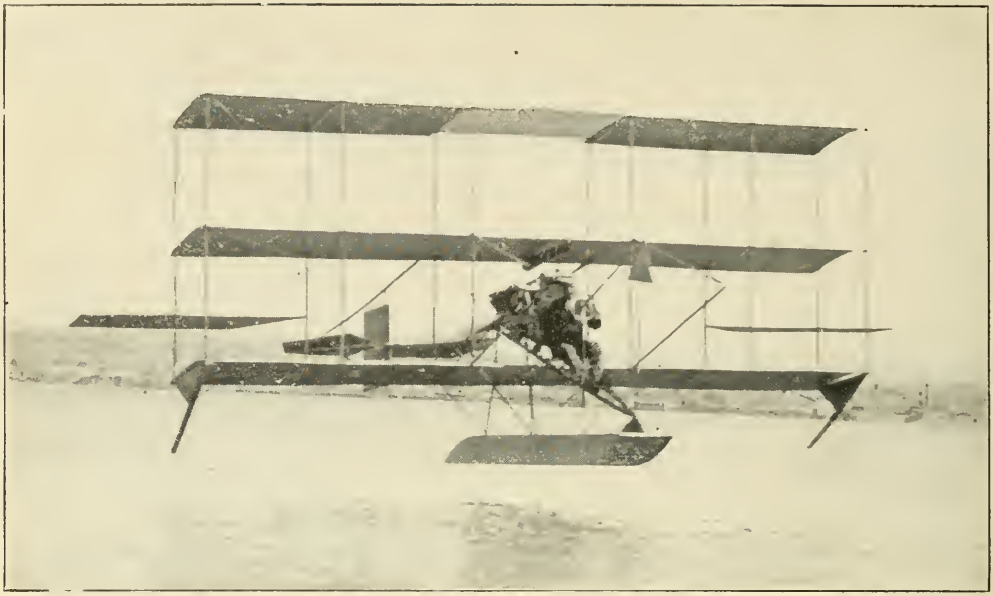
WALSH TAKES UP FAMILY.

C. F. Walsh, who has won several trophies as a novice flyer, has recently changed engines in his Curtiss-type, installing the new Macomber 7-cylinder rotary engine, and on February 19 took up his wife and his two children at one and the same time for a mile straightaway flight at the Dominguez field. Harry Harkness is reported to have purchased a machine from Walsh.

With the Paragon propeller the Macomber power plant gives 340 lbs. standing thrust. The total weight of Walsh and family is 419 lbs.



Curtiss Being Hoisted on Cruiser Deck.



The third (upper) surface is an attachment to the regular Curtiss aeroplane, and enables the carrying of 200 lbs. additional weight with the same motor.

Walsh is now carrying passengers on short flights.

Earle Remington and William Stevens have pooled their interest and they purchased the Radley-Bleriot machine used at the Dominguez meet, together with the Gnome engine with which it was equipped. They took it to Dominguez field and Remington mounted the machine and shot it off the ground. He managed to keep in the air down a quarter leg of the course, where at an altitude of 50 feet he shut off his engine. The machine pitched nose first for the ground and was smashed, Mr. Remington escaping unhurt. The engine was not damaged and they are repairing the machine. Mr. Stevens intends to put the engine in his monoplane to try it out later.

The Cannon brothers have been making mile flights in a Curtiss-type biplane of their own construction, equipped with a Ford automobile engine weighing 150 lbs. They have tuned the engine up to a notch where they are getting 30 h.p. out of it.

American Altitude Record.

The Aero Club of California has just completed its official work on the results of the Los Angeles meet. The altitude of 10,575 feet, as given out at the time, made by the late Hoxsey on December 30, has been reduced to 10,428 feet. As we have printed before, the 11,474 altitude was not official, as the barograph had not been calibrated. This falls just short of beating the previous world's altitude record.

WISEMAN MAKES FAST SPEED.

Fred. J. Wiseman, of San Francisco, made a cross-country flight from Petaluma, Cal., to Santa Rosa, a distance of about 12 miles, in fast time, using his big Farman-type with Hall-Scott engine.

The flight included the delivery of a newspaper, which he threw off at farm houses. He also carried orders from Petaluma firms to Santa Rosa business houses and letters from Postmaster Olmstead, of Petaluma, to Postmaster Tripp, of Santa Rosa.

Wiseman is an amateur who built his own 'plane and who has made some very good flights. The details and pictures of his machine were published in AERONAUTICS when he made his first flights.

CLEVE T. SHAFFER.

HARROUN MAKING AEROPLANES.

Ray Harroun has quit the auto racing game since he drove the Marmon in the Vanderbilt and has started the Ray Harroun Co., of Indianapolis, Ind., which has completed one monoplane and has five others under construction.

The photograph shows No. 1, equipped with a 2-cylinder opposed air-cooled motor of 18-h. p. rating, cylinders 4x6 in. It is said to develop 22 h.p. at 1800 r.p.m. The engine weight is 95 lbs. The framework is entirely of steel tubing. The body is covered with aluminum sheeting. Each wing measures 6 ft. by 14½ ft. The control is similar to the Antoinette. The whole machine weighs 400 lbs.

NOVICE FLIES AT MINEOLA.

August Inmel, Jr., of Detroit, recently bought a Curtiss-type machine from Henry C. Cook, who has made a number of these machines for various purchasers, on March 11 made his first flight at the Mineola field. Instead of being content to run along the ground as directed, Inmel got immediately tired of this and shot into the air, with the Elbridge "Featherweight" wide open. The front wheel threw mud in the novice's face after landing once and getting off again, and he had to get down with both eyes closed, feeling for the throttle lever. He escaped accident.

REX SMITH FLYING AGAIN.

After attendance at the shows, which took valuable time from legitimate work, Antony H. Jannus took out the Rex Smith headless biplane, with Emerson engine, again at College Park on March 5. Going up to 700 ft., he started for Washington, but bad winds made it dangerous, and after going 1½ miles, landing was made in a little clearing.

ACTIVITY IN THE SOUTHERN STATES.

New Orleans has a large number of "Aeronuts," and six or seven machines under construction. P. A. Rahn, 220 Decatur St., has a Bleriot XI, equipped with a 10-60-h.p. Elbridge motor. A man by the name of Troxey has a novel biplane, equipped with a Detroit aeroplane motor, and claims to have made several jumps. A Mr. Summergill is working out a self-balancing monoplane to be equipped with two revolving motors running in opposite directions. The National Aviation Co., composed

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Fuselage and Chassis assembled - - - - - - 200.00
Control $125.00 Steering wheel, seat, foot yoke and device operating warping of main planes, elevating planes and vertical rudder.
Alighting Gear $200.00 3 wheels, tires, castings, etc., all brazed and assembled.

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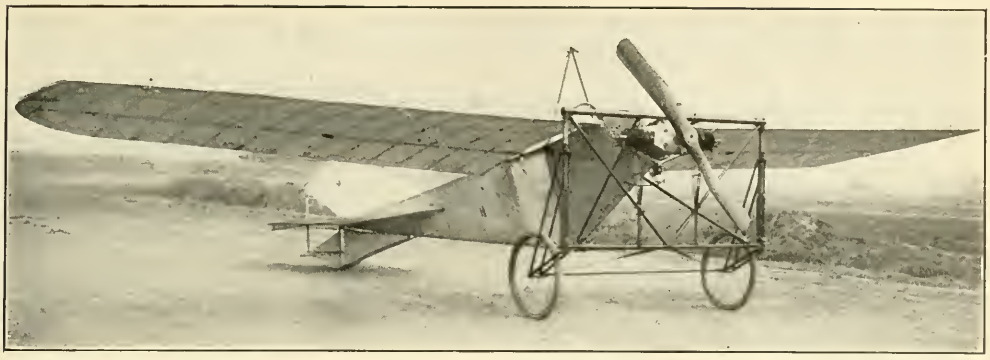


Harroun's Steel Monoplane.

of six or eight mechanics, have co-operated and are building a Bleriot XI, and seem to have the right dope in construction. Other machines are under construction.

Birmingham will be heard from when J. L. Morris finishes a Bleriot XI. His machine is the nearest duplicate to a genuine Bleriot I have seen. Mr. Morris is in the auto business and had the machine constructed near his garage and will attempt to fly it with a 110-lb. Buick auto motor, but intends purchasing a standard aeronautical motor. James Odom built a biplane several years ago and has succeeded in making short jumps, but lacks the nerve to fly a machine.

R. O. RUBEL, JR.

FLIGHTS BY NOVICES IN DENVER.

The Mathewson biplane has made thus far exhibition flights at Pueblo and Trinidad, Colo., and Albuquerque, N. M. At Pueblo the machine had a smash-up with the fence, on account of the poor landing place and the wind. The wind was bad, but flights were made only to fulfill the contracts. The machine was then taken to Trinidad, and there, preliminary to the flights, the tent was blown over. The damage was soon repaired and flights were made as scheduled. While flying, Aviator Thompson got into an air hole and the machine fell about 100 feet. Albuquerque was the next and last place, and there things went off smoothly. Aviator Thompson and his helper, Georgie Van Arsdale, have returned to Denver to attend to the arrangements for the Mathewson Aero School, which is to be started within thirty days. They are also busy starting four-men machines. Articles of incorporation have been drawn up for the Mathewson Aeroplane Co. E. Linn Mathewson and George Thompson are the main principals, but Georgie Van Arsdale also comes in for a little. Mr. Mathewson says he has enough pupils booked for his aviation school to fill two terms.

The first photographs of the Mathewson machine were published in AERONAUTICS. Thompson was a novice when he made his first exhibition flight. Elbridge engine and Gibson propellers are used.

GENTZLER MAKES ATTEMPT TO FLY.

Louis D. Gentzler in his own machine, motored by a home-made engine built by Guy C. Walters, a Denver mechanic, recently made an attempt to fly it in this city at Berkeley Park.

Mr. Gentzler has a peculiar wheel arrangement on his machine, having one large wheel under the front plane, a tail wheel and two outrider wheels on the wings, which do not touch the ground. Mr. Gentzler hopes to be able to run along on this one wheel and keep his stability by means of his own automatic device. In the trial, Mr. Gentzler was not expert enough in handling the machine, and it tipped over on one wing, caving the wheel in. This delayed further trials until Mr. Gentzler made repairs.

A. BROTT GETTING NEW ENGINE OUT.

Andrew Brott, a local engine builder, is getting three new water-cooled aero engines out, which he expects to place on the market. Mr. Brott has formerly built an 8-cylinder air-cooled engine, one of which he used on his biplane, which did not prove up, though the engine showed fine work. Mr. Brott says he will have details out later on.

ROBERT A. DONALDSON.

NEW BOOKS.

MOEDEBECK'S HANDBOOK, cloth, small 8 vo., 920 pp., illustrated, with many tables, edited and enlarged by Prof. Dr. R. Suring, published at 10 marks by M. Krayn, Kurfurstenstrasse 11, Berlin W. 57, Germany.

This is the largest edition (third) yet published of Major Moedebeck's work, which ranks in aeronautics with Kent in engineering. It is printed wholly in German. The book is a complete compendium of aeronautical knowledge. The results of all experimentors are tabulated and all known data are given in concise form.

The principal subjects are: Physikalischen Eigenschaften und Technologie der Gase—Physics of the Atmosphere—Aerology—Drachen und Fallschirme—Photographie—Militar-Luftschiffahrt—Die Ballontechnik—Das Ballonfahren—Entwicklungsgeschicht Entwicklungsgeschichte d. Luftschiffs—Luftschiffbau—Navigation von Luftfahrzugen—Der Tierflug—Der Gleitflug — Flugtechnik — Verbrennungskraftmaschinen fur Luftschiffe und Flugzeuge—Luftpropeller—Vereinsnachrichten—Tabellen.

DER MASCHINEN-UND VOGELFLUG, Eine historisch-kritische flugtechnische Untersuchung, von Josef Popper-Lynkeus, 8 vo., paper, 103 pp., published at 3 marks by M. Krayn, Berlin W. 57, Germany.

Contents include: Ueber theoretische und praktische Leistungen um Gebiete der Flugtechnik—Ueber die Frage: Kann der Mensch ohne Hilfsmotor fliegen?—Ueber den Segelflug und das Kreisen der Vogel—Das erste freifliegende Modell eines Drachenfliegers von Penaud—Ueber die Formeln fur den Luftwiderstand — Das Gleitproblem — Ueber die Grosse der Flugarbeit der Vogel—Verschiedene Vorschlage Penauds—Kraft der fliegende Tiere—Detaillierte Beschreibung eines Flugmaschinenprojekts von Penaud und Gauchot—Die Personlichkeit Penauds.

THE AEROPLANE, an Elementary Text Book on the Principles of Dynamic Flight, by T. O. B. Hubbard, secretary Aeronautical Society of Great Britain, joint editor "Aeronautical Journal"; J. H. Ledeboer, B. A., scholar, Caius College, Cambridge, editor AERONAUTICS, joint editor "Aeronautical Journal," and C. C. Turner, author of "Aerial Navigation of To-Day," Cantor, lecturer on Aeronautics, 1909. Small 8 vo., cloth, 127 pages with many diagrams and plates. Published by Longmans

(Continued on Page 131)

FOUR ROTARY ENGINES ON AMERICAN MARKET

WITHIN a period of thirty days no less than four rotary, air-cooled, American-made motors have been placed on the market. One of these is a two-cycle. The Macomber has already been in the air in the Walsh biplane, and the Avis is to be tried out on the Longfellow monoplane so soon as the ground is dry enough to permit flights.

Rotary Indian.

To the casual observer the beautifully finished rotary Indian engine, made by the Hendee Mfg. Co., of Springfield, Mass., which was first seen by the public at the Boston Show, closely follows the Gnome.

To the apparent objection raised that oil would naturally be thrown by rotation onto the spark plugs and quickly foul them the makers answered as follows:

"As to the question of oil forced to the heads of the cylinders and fouling the plugs, it can be said that this only occurred in the earlier types of the Gnome motor, in which machine the plugs were in the head of the cylinder, and the induction valves were of the automatic type, placed in the piston itself. This permitted large quantities of oil to pass from the crank case to the head of the cylinder, and directly to the plugs. With the improved construction the induction valve is placed in the head of the cylinder, and is mechanically operated. This does away with the greater portion of the difficulty; and such oil as gains access above the piston is thrown out of the exhaust valve, thus keeping the head clear; and as the plug is now placed in the side of the head it is in a position where no difficulty is experienced from fouling or sooting."

Its claims for superiority over other motors of its type are first, its simplicity. By the construction of the Indian motor it is possible to remove a cylinder head for cleaning, or a cylinder for examination of a piston, or replacement of a ring, without disturbing any of the mechanism except the induction pipe on that particular cylinder. This cannot be done in any other motor without removing portions of the crank case and valve gear.

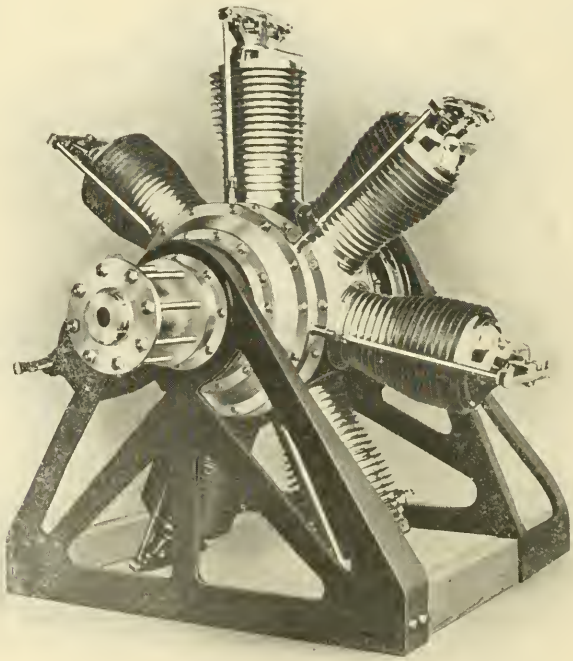
The valve gear of the new Indian motor is of an original design, which is believed to be simpler and more efficient than any that have heretofore been produced.

This motor, four cycle in principle, has seven cylinders, 4⅜ in. bore by 4⅞ in. stroke, which represents 53½ horse-power by the A. L. A. M. rating. The motor complete does not exceed an extreme diameter of 36 inches, and the frame is about 26 in. wide.

The crank case and cylinders are machined out of nickel steel forgings, each part in a single piece, producing not only a very compact, but an extremely strong, construction.

Both valves are mechanically operated by improved mechanism. This is a departure from the usual practice of employing an automatic inlet valve; and while the mechanical type of valve produces better results, the method of construction employed in this motor is actually simpler than the automatic valves in many motors of its class. Annular ball bearings throughout.

Simplicity of construction has been carefully preserved throughout the design, and is well illustrated by the method employed to secure the cylinders to the crank case. Each cylinder is secured by a single castellated screw ring, and a cylinder may be removed in a very few



Indian Rotary Aero Motor

minutes by simply removing this single ring without disturbing any of the portions of the crank case or its fittings. The cylinder head is secured in a similar manner, and affords equal facility for cleaning the head or inspecting the valves.

The lubrication is by a positive oil pump feeding to a sight feed gravity lubricator, which is always within view of the operator.

The ignition is by the well-known high tension Bosch Magneto and special distributer.

It is priced at $2,000.

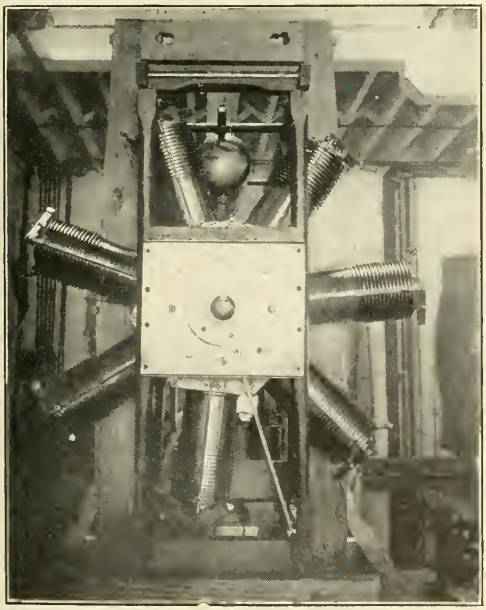
GYRO MOTOR.

The Gyro four cycle motor has had its first run and photos were taken which are reproduced in this issue. Propeller and power tests have not been made as yet. There is to be noticed an absence of vibration with the engine running.

Another noticeable fact was the absence of great noise, even when running at very high speed. No mufflers are used yet it is possible to have conversation in the shop while the motor is running. About one-half pint of mineral oil is used per gallon of gasoline. The pistons never stick or run the least dry. The oil hoods on the cylinders are a striking success. "When we took the motor apart there was a heavy film of oil on each of these hoods, showing how it had ben caught by the hood and was sliding down to the cylinder walls and piston rings."

Several new motors are under way and deliveries can be made in about sixty days. The price will be $2,500, and the company is accepting a 30 per cent. deposit under the following test guarantee, the test to be carried out in the presence of the purchaser or his representative:

1. The engine shall run continuously and without stop under full load for five hours.
2. The engine shall develop a standing thrust of 400 pounds with an 8-ft. Paragon Propeller
3. In case of failure to meet the above test requirements the purchaser may cancel the contract and the money will be refunded.

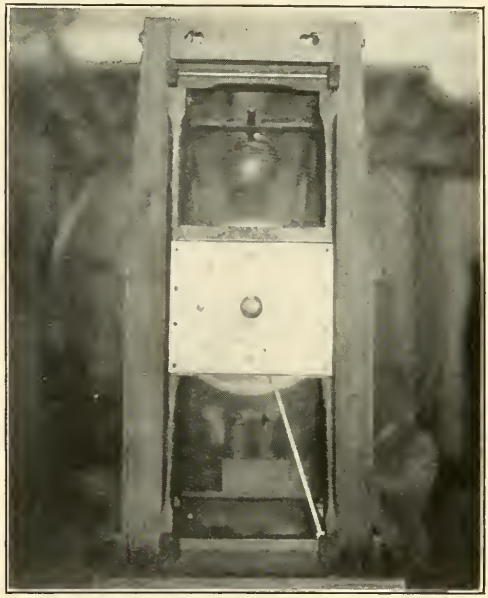


The New "Gyro" Motor.

In addition to the points brought out in the article published in the March issue, the motor can be run at low power, half power and full power, all under control of the aviator during flight, by changing the amount of compression in the cylinders, as is the system employed in the Adams-Farwell. It is therefore never necessary to stop the motor entirely for gliding, and it can be changed from one power stage to another at will. In starting, the aviator can readily crank his own engine on low compression and while the engine is running slowly, mount his machine and turn on full power.

Start From Seat.

If it is preferred to do the cranking from the seat a simple lever connection can be made to



Motor Running, Shows Absence of Vibration.

a ratchet device which is furnished when requested and with this arrangement the aviator can always start his engine alone and without assistance when rising from either land or water.

The motor is made by the Gyro Motor Co., 774 Girard St., Washington, D. C., and listed at $2,500.

AVIS ENGINE

The makers of the Avis engines, selling at $750, have apparently reached a low limit (79 lbs.) for their 30 H. P. (32 H. P., A. L. A. M.) engine, which was first shown at the Boston Show. Although this seems too light for the power developed, still the makers claim it will stand the wear and tear of actual service.

The engine is of the two cycle revolving type, and contains many novel features, chief of which is the cooling device consisting of two deflecting plates to each cylinder that catch the air and convey it around the cylinder. It is claimed the engine will run cool under all conditions; and that it is not necessary to have it in an aeroplane going at a high rate of speed to accomplish this fact. Another feature is the winding of the cylinders with steel piano wire, allowing the use of grey iron in the construction and still getting the strength of steel. It is also a great factor in the radiation of the heat from the cylinders.

The crank double-throw shaft, weighing but 7 lbs., is made of the best chrome nickel steel, bored hollow for lightness, and to admit the gas and oil. It runs in the R. I. V. imported annular ball-bearings. The connecting rods are made of oval steel tubing, with the ends, which are made of high carbon steel, electrically welded, to the tube, and are also ball-bearing on the crank shaft.

The top end of the connecting rod is fastened to a phosphor bronze bracket, with a light hollow pin, that simply holds it in place. All the thrusts come directly on the head of

the connecting rod itself, and not on the pin as in the ordinary system. The bronze bracket is made with two studs turned on itself, threaded and fastened to the head of the piston with nuts on the top, which same studs and nuts hold the baffle plate.

The crank case is of aluminum and is closed on one end with a flange cast on to which to bolt the propeller. The other end where the shaft protrudes is fitted with a stuffing box to keep the compression in the crank case.

The cylinders, 5 x 5½, are made from a hard, close-grained grey iron that is equal to the best French cylinder castings for tensile strength, and will run with the minimum amount of lubrication. They are finished all over so that the expansion and contraction is equal on all parts.

The gas is carried from the crank case up around the lower half of the cylinder by an aluminum jacket, to the intake ports, which are at an angle of 45 deg.

The exhaust ports are on the back side of the cylinder so that as it revolves the vacuum formed helps to clean out the burnt charge. The piston opens and closes the ports, and the only valve to be looked after is the check valve between the engine and the carbureter. The pistons are cast of the same material as the cylinder, and owing to the fact of not using a wrist pin, and therefore having no bosses cast on the inside, it is machined all over, outside and in.

They are fitted with four rings, also semi-steel. Every part of this engine is ground to a perfect fit for the work it has to do, and all parts are made interchangeable. The cylinder heads are of aluminum, and the whole is fastened together with four tension bars or bolts, being amply large to take care of all strains due to centrifugal and other forces. The lubrication is taken care of by mixing the cylinder oil direct with the gasoline.

A thrust of 325 lbs. with a Paragon propeller is claimed.

The makers, Avis Engine Co., are located at Allston, Mass.

THE MACOMBER ROTARY ENGINE.

An entirely new type of gasoline engine is being built by the Macomber Rotary Engine Company, of Los Angeles, California, for aeroplane use. This motor is radically different from all others in theory, design and operation, there being no crank shaft, and yet having a similar cylinder and piston construction to the ordinary vertical engine, but a mechanically variable piston stroke.

The attached photograph shows the Model 'A" 50-60 H. P. motor. It has seven cylinders, 7 x 4¼, placed around and parallel to a central straight shaft. The standard valve in the head four cycle action is used, all valves being operated from one four-point cam placed on the central shaft and running in the same direction. In operation the entire motor revolves with the exception of the small case at either end. From these cases the supports run, the one at the head also forming the holder for the magneto and carburetor.

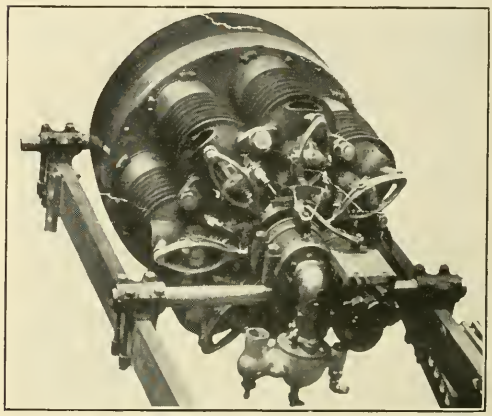
Inside of the large case at the propeller end is placed a "stroke-plate" which is attached to the shaft in such a manner that while it must rotate in the direction of the engine, it is perfectly free to be tipped at any desired angle. To this is attached the connecting rods and by tipping the stroke-plate at various angles the traveling distance of the piston can be varied. This allows the use of a very high compression for operating, which can be reduced to any desired point for cranking purposes.

Several different forms of levers are supplied to operate the change of stroke, any of which can be operated both when the engine is at rest or running.

The motor is air-cooled, does all its own oiling by centrifugal force, and runs without vibration on light wood supports one inch wide by three inches deep. All bearings are large diameter Hess-Bright and New Departure ball bearings with the exception of the connecting rods, which have full ball and socket bearings.

A wonderful compactness has been secured —the greatest diameter being only nineteen inches and the length twenty-eight inches. The weight complete is two hundred and thirty pounds.

Ignition is extremely simple, a Bosch magneto is operated by the cam gears directly connected, the current taken by six inches of wire to a stationary electrode on the top of the front bearing case. Spark plugs in the cylinder heads pass within a sixteenth of an



Valve End of Macomber Rotary Motor.

inch to this electrode to which the spark jumps.

Any standard carburetor can be used. A straight fuel injection system is also installed when desired. The range of speed is from 150 to 1,500 revolutions per minute, although the average operating speed is about one thousand revolutions, at which it is claimed to develop a full fifty horse power. The weight is given as 190 lbs.

The motor is being placed on the market by Godsmark, Curtis & Co., of Los Angeles, Cal., at $2,000.

The McCurdy flight from Key West has been figured out by Lt.-Commander Yates Stirling, Jr., as 89.78 statute miles. The flying time was 1 hour, 59 minutes, and 12 minutes were consumed in circling around before starting, making the total duration 2 hours, 11 minutes. A mean speed of about 45 m. p. h. was maintained.

The 1911 Gordon Bennett will be flown over the British Aero Club's grounds at Eastchurch. It is quite a good open ground and not too much broken up by ditches. It is, however, on a small slope and takes 1½ hours from London.

NATIONAL COUNCIL WANTS MEETS

THE National Council has sent out a bulletin urging the organization of meets throughout the country. Quoting from the bulletin: "It is necessary for the aero clubs throughout the United States to immediately arrange a series of aviation meets. The experience of the aero clubs of Europe has shown that there is no more effective way of popularizing the art of aviation and stirring up public interest than by holding a series of well arranged and closely contested competitions at different points. * * * * In this country, where the interest in aviation is far less than it is on the other side of the Atlantic, it is the more necessary that an extended series of aviation meets should be held. Every aero club in the National Council should hold at least one meet during this season, and no time should be lost in making the necessary arrangements."

It is urged that grounds be selected and the business men be organized to finance the affairs. It is even suggested that participants in these fly from one meeting place to the next on the list.

The question of meets is one which requires rather more thought than has been given in the past. A real "meet," where all contestants pay entrance fees, compete solely for prizes, with no guarantees to cover "expenses," conducted on the general lines of other purely sporting events, mentioning automobile races and horse races as examples, seems to be still in the future. A meet strictly on these lines would be a novelty in the States. A purely sporting event a meet eventually must be, but to date it has been an impossibility—and it looks as though it would so remain for at least another year.

One can venture the assertion that by summer there will not be three standard machines which would be entered by owners on a sporting basis. There will not be more than a half-dozen owners in a position to enter into contests that would be willing so to do. The majority of machines now in existence will devote all energies to giving exhibitions for pay.

The exhibitions that have been given during the past year have proven of wonderful benefit in arousing interest. Greater work will be done this year in the same way. But it seems out of the question to attempt to arrange a purely sporting event.

The attempts to combine competition with paid performances, or with allowance of considerable sums for "expenses," to state examples, the last Los Angeles meeting and the Belmont meeting, have proven detrimental to the pocketbooks of the backers. It is reported that the meets that have been held all over Europe, and in other parts of the world, on the same basis, have resulted in losses. On the other hand, the exhibitions, pure and simple, have, so far as known, generally proved successful from a financial standpoint.

In time it will be the purely sporting competitions which will prove of the greatest interest. There is no element of contest in the 150 exhibitions that have been given during 1910 all over the United States, yet the majority of all these paid profits to the promoters in one way or another. The larger portion of the people attending had never before seen an aeroplane in flight, and interest and curiosity brought results.

While the latter is true also of the affairs in which there have been contests, mentioning Los Angeles and Belmont again, the abnormal expense of administration attendant upon the arranging of actual contests and the securing of certain entries has brought losses to the promoters. The Wright Company and the Curtiss Exhibition Company have worked on an economical basis. They have no "pylons" to erect, or sheds to construct, and their administration cost is low.

The promoters of flights seem to have but two courses open: to run a purely sporting event at a loss, or conduct a purely exhibition affair and meet expenses or make a profit.

It is a case where adherence to the principle of sport means financial loss and, with a decreasing number of affairs, the falling short of all opportunities to advance general interest; and where the money question is paramount and the stirring up of sentiment to a greater extent.

Which is to be—principle or policy?

AERONAUTICAL SOCIETY RUNS BIG BANQUET

IN America the science of aeronautics has never been more signally recognized than it was on Thursday, March 23, when the President of the United States, at the White House in Washington, received by appointment the committee from the Aeronautical Society which invited the Chief Executive to be its guest at a banquet to be given at the Hotel Astor, New York City, on Thursday, April 27.

The committee consisted of Hudson Maxim, president of the Aeronautical Society; Lee S. Burridge, vice-president; William J. Hammer, Louis R. Adams and Thomas A. Hill, directors; and Arnold Kruckman. The distinction accorded the Aeronautical Society by President Taft is indicative of the large importance of the dinner.

Among other distinguished guests there are expected to be present Gov. Woodrow Wilson of New Jersey, Gov. F. L. Baldwin of Connecticut, Gov. Judson Harmon of Ohio, Thomas A. Edison, President Butler of Columbia University, President McCracken of New York University, Wilbur and Orville Wright, Glenn H. Curtiss, Eugene Ely, Walter Brookins, Gen. James Allen, head of the U. S. Signal Corps; Augustus Thomas, the playwright; Arthur Brisbane, the noted editor; John Temple Graves, formerly the famous editor of the Atlanta Constitution; Emil Boas, resident head of the Hamburg-American Steamship Company; Prof. Herschel Parker, the noted explorer; representatives of the various foreign aeronautic associations, as well as delegates from the many notable clubs in America. Science, journalism, statesmanship, commerce, finance, diplomacy, exploration, land and marine military will all be represented at the dinner. So far as this publication is aware, it is the first time that the subject of flight will be discussed from so many opposed angles.

In addition to the feast of reason and wit which the society has prepared, surprisingly unique features will be introduced for pure entertainment which will make this banquet notable among all banquets for many months to come.

The banquet committee has its headquarters at the Hotel Astor, New York City, where communications should be addressed. The price per cover will be $5.00.

Your journal opens a new field for the amateur, as it provides every opportunity for developing ideas by placing a person in touch with manufacturers of supplies and material of every conceivable kind. This feature alone is well worth the subscription price. To this is added the news from home and abroad, the valuable aids of construction and many other good things. I have read your journal with profoundest interest and would unhesitatingly recommend it to any person interested in aeronautics.—W. R. McGILL.

News In General

CURTISS PINEHURST SCHOOL.

On March 18 Beachey opened the Pinehurst (N. C.) school of the Curtiss Aeroplane Co., with Roland B. Middleton, a New York man, as student. On the 25th McCurdy will make a series of exhibition flights. This school, which is intended to be an annual feature at this resort, will close May 1.

Permanent grounds are being arranged for at Palm Beach, Fla., and an annual winter school is intended to be conducted at this resort.

Pupils will be taken at a tuition fee of $500, which will be allowed on purchase of a machine, if the student decides he likes flying. A deposit of $500 is required to cover damages in learning, any surplus remaining to be returned. At San Diego, Cal., three army officers and a naval officer are already learning, as are several civilians.

C. Grahame-White & Co. charges $500 for tuition on either Bleriot or Farman machines, or $750 on both. A deposit of $250 had to be made to cover damages and the pupil had to take out insurance to cover third party risk.

One may learn to fly the Breguet machine, which has been breaking passenger records of late at Brayelle, for $400, the student standing breakages, depositing $300 with Breguet as security. If the student is reckless or is deemed a dangerous pupil, Breguet reserves the right to restore to him his tuition fee, less $100. In beginning the lessons the apprentice agrees to assume all risks. This is true of the other schools.

Henry Farman will make one a pilot for the sum of $500, payable in advance. The student assumes risks of breakage and deposits another $500 to cover damages. Three weeks at the outside are deemed sufficient to make one a pilot. Sheds for aeroplanes, which can be rented at Mineola or Belmont for $10 a month, cost $100 monthly at the Farman school, or $800 by the year.

LATEST BURGESS-WRIGHT AEROPLANE.

By the first of April W. Starling Burgess, of the Burgess Co. & Curtis, Marblehead, Mass., will be at the Mineola (N. Y.) grounds training several pupils in the use of the Burgess company's "Model F." This will be a new machine to the American public and is called the "Burgess-Wright." This will be the same size (39 ft. spread) as the Wright machine, with Wright engine and propellers, but embodying Burgess constructional features.

Mr. Burgess was the first civilian pupil of the Wright company, other than their own aviators, and, as announced in AERONAUTICS last month, completed his training under Frank Coffyn at the Augusta (Ga.) Wright camp, where he made 26 flights in all, 14 of which counted as lessons.

The Burgess-Curtis Company is the first concern to recognize the Wright patent by obtaining a manufacturing license.

FRED SHNEIDER STARTS SCHOOL

By the middle of March Fred. Shneider, 1020 E. 178th St., New York, will have started his school at the Belmont race track, where he now has his shed. Joseph Richter will be taught to fly and he will act as instructor. Two or three pupils will start in under direction of Mr. Shneider as soon as the school opens.

WRIGHT COMPANY WILL CONTINUE EXHIBITIONS

The Wright Company has not gone out of the exhibition business—in fact, 1911 will see more of this than the year past.

What is more hopeful for advancement of aviation is the fact that aeroplanes are being purchased now for sporting purposes only. W. C. Beers and several friends of New Haven, Conn., belonging to the new Aero Club of Connecticut, have Wright machines ordered for delivery on May 1. Robert J. Collier has one already; Russell A. Alger will have one, and T. B. Funk, of Dallas, Tex., is another purchaser. Several Curtiss machines are in the hands of "outsiders," and the Burgess Co. & Curtis have several on order.

During the last month Coffyn made some 60 flights at Augusta, staying in the air over 18 hours, despite almost continually unpleasant weather. These were nearly all two-man flights. No one has broken a stick or had any difficulties. The actual cost of maintaining and operating aeroplanes does not seem to run into such excessive figures as has been given in a recent article, and the degree of success attained by the pupils at Augusta shows it is quite a simple matter to learn to fly.

On some of the new Wright machines is being used a special fabric prepared by the Goodyear Tire & Rubber Co., of Akron, Ohio, which they call their "Wing Aeroplane Fabric." The Wright Company was largely responsible for its construction.

THE FIRST AERO CHAUFFEUR

Russell Alger, of Detroit, has a man at Augusta learning to fly. Another pupil is George Manor, a friend of Mr. Burgess, who has bought a Model F.

COMBINATION AIRSHIP AND AEROPLANE.

Lieut. H. E. Honeywell, of 4460 Chouteau Ave., St. Louis, Mo., not long ago completed a series of tests with what he calls a diroplane. The appearance is that of a rather short Perfecto cigar cut through the middle longitudinally. The bottom, therefore, is a plane surface. The gas bag is built round a framework. The volume of gas is barely great enough to lift the airship with two passengers. The engine can be started or stopped in the air without the operator leaving his seat. The engine and seats for the two men are located about the center of the apparatus from end to end and suspended below the envelope by a frame triangular and cross section.

Mr. Honeywell declines to give out much information about the new apparatus, but it is said to have increased speed over the other type of airship.

CONGRESSIONAL LIBRARY WANTS BACK NUMBERS.

The Librarian of Congress is anxious to secure the following issues of AERONAUTICS which cannot be supplied by the publishers: All numbers July to December, 1907; all numbers January to June, 1908; July to October, 1908. The National Library will appreciate receiving these copies. Address Librarian of Congress, Periodical Division, Washington, D. C.

$1,000 MOTOR PRIZE.

The closing of entries for the Automobile Club of America's $1,000 motor prize competition has been set forward to July 1. The conditions are still being prepared and it is expected that by the middle of March they will be in shape for publication.

NOTE ON SELLERS AEROPLANE.

The Aero Club of America, in a recent bulletin, stated that the Breguet machine, which recently broke passenger speed records, was the first to carry a weight greater than its own. The club has overlooked the fact that one of

its own members is flying almost daily in a machine which, in every flight, carries 2½ times its own weight—but then these flights of Mr. M. B. Sellers, the member referred to, have not been "officially observed" and therefore "do not count." The fact remains, nevertheless. Coming down to figures, Mr. Sellers' machine (of which full details and description have been printed in AERONAUTICS on several occasions), which flies with an engine rated at but 10 h.p., weighs 110 lbs. ready for flight. Mr. Sellers himself weighs 140 lbs., a total of 250 lbs. for a 110-lb. machine, with 6 actual h.p.; over 41 lbs. being carried for each horsepower.

INCORPORATIONS.

Baltimore Monoplane Co.,, Baltimore, Md., $300,000. D. J. Carter, 2009 Boone St.; J. B. Sebastian, 204 N. Liberty St. Manufacture and conduct school.

Marquette Aeroplane Co., Indianapolis, Ind., aeroplanes.

The Standard Airship Co. has been incorporated at Columbus, Ohio, to build and sell aeroplanes. The capital stock is $50,000. The incorporators of the company are: T. P. Horrell, C. A. Ricks, A. Y. Gowen, W. C. Saeger and G. B. Collins, of Cleveland, Ohio. The aeroplanes will be manufactured under patents held by H. J. Sharp.

Penn Aero Construction Co., Philadelphia, Pa. Capital, $125,000. Incorporators: Kenneth Robertson, E. N. Johnson and Frank A. Kuntz.

Ellithorpe Aerial Co., Marblehead, Ohio. George H. Ellithorpe and others; $12,000.

Lamson Aeroplane Co., Los Angeles, Cal., $100,000. Incorporators are: Charles H. Lamson, H. A. Linthwaite, O. C. Linthwaite, R. I. Blakeslee and Buel H. Green. H. A. Linthwaite is said to be the financial backer. He is an architect of Columbus, Ohio, and has accumulated a considerable fortune. The concern will build aeroplanes, employing wing warping under the patent of C. H. Lamson. About a year ago suit was filed by Lamson against the Wrights, in which Lamson alleged that he had invented and patented the warping device several years before the Wrights experimented with it.

Johnson Aeroplane Co., Brooklyn, N. Y., $50,000. Directors: Ernest A. Johnson, Brooklyn, and Edward A. Johnson and Simon A. Frace, of Middletown, Conn.

Alleas Aviation Co., Boston, Mass., $50,000. Jean M. Alleas, Joseph Brettler, Emile F. Conlon.

Siedlinger Aeroplane Co., Wilmington, Del., $100,000.

United States Aero Publicity Co., Columbia, S. C. (in process of formation), $500,000. Victor Jossenberger, E. S. Ward, W. G. Howard.

Aeroplane Amusement Co., 75 Westminster St., Providence, R. I. Capital, $100,000. Gardner C. Luther, J. Elmer Payne, John S. Whitehouse, David G. Edwards. Aeroplane amusement device for parks.

The International Airship Co., 15 Ramapo Ave., Paterson, N. J., $250,000. Incorporators: Victor L. Ochoa, Ed. Van Winkle and Wm. S. Martin. Promoting "Ochoaplane."

BRITISH GOVERNMENT AERO COMMITTEE

The British War Office are forming a Technical Advisory Committee on Aeronautics, and have invited representatives from the Aeronautical Society, the Royal Aero Club and the Advistory Committee on Aeronautics, commonly known as Lord Rayleigh's Committee, to serve thereon. This is the first move in the formation of a Technical Aeronautical Reserve which is about to be formed as an adjunct to the army. What it will be, what it will consist of, and what it will do, the War Office themselves do not yet know.

WRIGHT-CURTISS SUIT.

The Wright Company finished taking testimony in a suit which began last summer against the Herring-Curtiss Company and Glenn H. Curtiss a few weeks ago and every effort is being made by them to bring the case into court before the summer recess. The Wright Company's suit against Grahame White for infringement in Farman and Bleriot machines is progressing rapidly. The Wright Company's testimony is entirely in and it is expected that the case will be disposed of some time during the spring.

In the former case, Curtiss has four months to reply, in the latter, the law limits the case to three months.

WHAT HAS BECOME OF—

The Wright aeroplane to have been purchased by the Aero Club of America last spring for the use use of members?

Charles J. Glidden's New York-Boston aerial line?

Albert C. Triaca's fine aeroplane?

The American Aeronaut?

The Prof. Todd-Stevens altitude balloon excursion?

Joseph Brucker's transatlantic balloon voyage?

The Baldwin dirigible that went to Germany?

Amherst's aerial signs for balloonists?

The aeroplanes all over the country that were all going to fly in the "next few days," or weeks?

The great aero park at Springfield?

Many of the aero clubs which have been formed the past year, of which nothing more has been heard?

Tillinghast?

—Reprinted from the April (1910) AERONAUTICS.

INTERNATIONAL BALLOON RACE NOT AT ST. LOUIS.

It is probable that the International balloon race of 1911 will be held at some other place than St. Louis. Cincinnati, Omaha, Indianapolis, San Francisco and Kansas City have all made applications to the National Council. A. B. Lambert has stated that St. Louis is not a candidate. The selection of the place has been referred to a committee of three, of which Clifford B. Harmon is chairman. This committee will report to the Executive Committee of the National Council at a meeting to be held prior to the April 4th general meeting.

The Pacific Aero Club, in San Francisco, points with pride to its October climate and the prevailing winds at that season. All these cities are making strong efforts to obtain the race.

At the last meeting of the Executive Committee, held March 7, the Milwaukee Aeronautic Club, the president of which is Sherman Brown, manager of the Davidson Theatre, Milwaukee, was admitted to membership.

The report of the Conference Committee was made, adopted and the secretary instructed to send a copy of the form of working agreement, arrived at between the Aero Club and the Council, with the amended by-laws to meet the conditions created by the working agreement, to the various clubs comprising the Council.

The meeting was attended by Messrs. Collier, Atherholt, Myers, Duffy, Harmon and Bishop. J. H. Joyce and John C. Eberhardt were represented by proxies.

NEW BOOKS

(*Continued from page 125*)

Green & Co., 443 Fourth Avenue, New York, at $1.00. The authors have put in simple language the principal laws governing aviation. It is a most suitable book indeed for the hundreds of experimenters now building machines of their own design or copying well known aeroplanes and without any fundamental knowledge of the laws of aero-dynamics. The contents of the book are divided into nine chapters which are again split up into many sub-divisions. The main divisions are as follows: Properties of the Air; The Resistance of the Air; The Inclined Plane; Flow of the Air—The Curve—Lift and Drift; Gliding, and the Theory of the Aeroplane; Stability and Steering; Propulsion; The Aeroplane; Navigation and Motors.

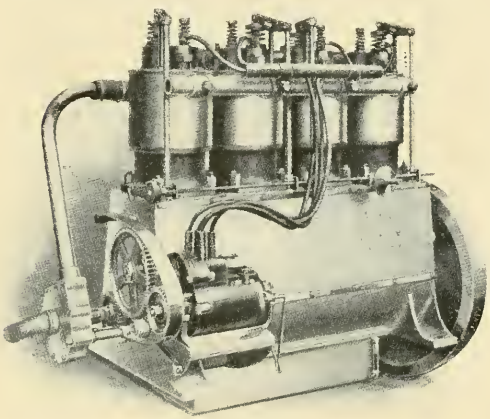
BOSTON'S SECOND AERO SHOW

BOSTON had its second aero show, under the efficient management of Chester I. Campbell, during the week of Feb. 20-25, at the Mechanics' Building. While it was the best show that has yet been held, probably, it was far from what a national aero show should be ,and, as usual, a financial loss, which Mr. Campbell, who was not over-sanguine of its being a bonanza, stood like the good soldier he is. The show was not held "under the auspices" of some irresponsible club.

Full Sized Machines.

THE WRIGHT COMPANY, Dayton, O., showed their Model B two-man machine, finely finished like the New York Show machine sold Collier. This spreads 39 ft., planes 6 ft. 3 in. fore and aft, propellers 8½ ft. diam.

The entire machine is governed by two levers, the first of which, when moved forward or backward, warps the wings and at the same time turns the rear vertical rudders, permitting the operator to maintain his balance without changing his course, regardless of the direction of the wind. The vertical rudders can also be operated independently to turn to the right or left by simply twisting the end of the lever with a wrist motion. The second lever controls the real horizontal rudder by which the direction of flight upwards or downwards



Left Side of Wright Engine.

may be governed. The speed of the engine is controlled by a foot pedal and the power can be shut off instantly at any time by pulling a cord within easy reach, which releases the compression. The propellers keep the engine turning over, and by pushing in a rod on the side of the engine compression is on again and the engine will again deliver power. The control is entirely by steel cables with nickel steel chain sections wherever they pass through pulleys. The entire mechanism is exposed so that even a casual inspection suffices to ascertain the condition of all working parts.

The biplane type permits of double trussing throughout, offering a strength obtainable in no other design, and the efficiency of the planes and propellers is so high that there is no need to sacrifice strength for lightness.

All machines are equipped with shock absorbing wheels for starting and landing. This aeroplane carries two persons comfortably, and the levers are duplicated so either person can operate the machine. It is a refined type of The Wright Flyer used by the exhibition department. The total weight of the machine is 800 lbs.

The wood used is the very best West Virginia and the cloth is a new Goodyear fabric, non-shrinkable.

The Wright Motor, 4 cylinders, 4¾-in. bore by 4-in. stroke, 30-35 h. p., weight 180 pounds, like the aeroplane and propellers, is a development of years of experimentation by the Wright Brothers, while the rest of the world was busy with a motor for automobiles. No effort has been made to reduce weight at the expense of safety, and a feature is its extreme simplicity. There probably has never been built a practical four-cylinder motor with fewer parts. The body is cast in aluminum and the cylinders are cast individually of gray iron. The nickel steel crank shaft is cut from the block, as is also the cam shaft, which operates the exhaust valves. The intake valves are automatic. Ample lubrication of bearings and cylinders is obtained by a positively operated pump. The cylinders are water-jacketed with aluminum and a centrifugal pump furnishes effective circulation. As this motor must operate in constantly varying altitudes, the gasoline is supplied directly to a mixing chamber without a carburetor, by means of a gear pump and injector which controls the amount of gasoline supplied to each cylinder in direct ratio with the speed of the engine. Ignition is provided by the Mea high tension magneto, offering an exceedingly wide range of control.

The power is transmitted to the twin propellers by means of nickel steel roller chains and the propeller shafts are of chrome nickel steel. Hess-Bright ball bearings are used. The price is $5,000.

BURGESS CO & CURTIS, Wright licenses, of Marblehead, Mass., exhibited several machines. The Model E, termed the "Grahame-White Biplane" ("Baby Farman"), is the fourth machine this company has built on the order from White for seven machines. This type is not being built simply for White, but is one of the styles the Burgess Co. is putting on the market. This is priced at $7,500, with a Gnome 50 h. p. engine as regular equipment.. "Prof." J. V. Martin, formerly of the Harvard Aeronautical Society, has been flying the "Baby" in England at the White school.

This machine is almost an exact copy of the "Farman" used by Paulhan in this country, but is quite a little smaller, though almost exactly the same proportions, and several improvements. The spread is 27 ft. without extensions, and 36 ft. 10 in. with them. The weight, less the engine, is 318 lbs. There is a little less curve than the old "Farman."

The fuel is carried in four tanks, two on the lower plane, on either side of the engine-bed, and the other two suspended from the top plane. Gravity feed to the engine from the top tanks, which in turn are fed by force-pump from the lower ones.

The regular Burgess gate control is used in place of the "Farman" single lever. For passenger carrying, extra detachable extensions are added to the top plane. Grecly S. Curtis "deflectors" are used in connection with the regular Farman-type ailerons, to equalize the resistance.

The fittings are all rolled cold steel, nickeled, in place of the old aluminum fittings. These are lighter, stronger and neater. Most of the well-finished machines on the market to-day are using cold rolled steel fittings, either oxidized, nickeled or enamelled.

The planes are covered with a very fine quality of sail-cloth made by Wilson & Silsby of Boston. This firm makes a specialty of aeroplane fabrics, and several of the machines in the show were covered by this company, and users praise it highly.

The "Flying Fish," another Burgess-Curtis, was the original one flown last season at Plum Island. It has been equipped with wheels and the fins on the top plane have been removed and in their stead there are regular Farman flaps. The Curtiss 4-cylinder motor is installed. This costs $4,500.

There was also another model, "B," shown, which was an exact duplicate of the "Flying Fish," except that it was mounted on the

single skid (with two small skids on either side), the same as the original.

Type "C" is also similar to the "Flying Fish," except that it has two skids, and is equipped either with or without wheels. The under-body is much heavier than the other types, the machine being designed for beginners. Equipped with 30 h. p. Clement-Bayard 2-cylinder opposed motor. Price $4,500. A very beautifully finished glider was also shown. This was built for Mr. A. A. Merrill.

Mr. Burgess states that the next machine which they build for Grahame-White will have a torpedo body, with all the controls, seat, etc., inside. The finish will be as fine as the most beautiful yacht—entire inside of torpedo body will be upholstered.

The Burgess Company & Curtis also showed their well-known model "D" and the "Cross-Channel" Bleriot brought over to this country by Greely S. Curtis.

The Model D is the one Hilliard has been flying, as accurately recorded in previous issues. This lists at $5,500, with the Indian 8-cylinder motor. All the Burgess-Curtis have Bosch magnetos. El Arco radiators are standard equipment.

THE METZ COMPANY, of Waltham, Mass.—This company showed their 7-cylinder revolving type motor, which they are putting out in three sizes, 35-60-125 h. p.

They also had a full line of Goodyear tires turnbuckles, hubs, aluminum fittings, also Bleriot-type rubber shock absorbers.

A small biplane with a 35 h. p. motor (4-cylinder, water-cooled), with Bosch magneto, was exhibited. This was built to order for a St. Louis man. Ailerons were hinged to rear beams by crossed leather straps.

Although this company showed several Bleriot-type fittings, and is making a specialty of Bleriot-copy monoplanes, they did not have their product on exhibition. The Bleriot machine which they showed at Belmont Park during the meet is now in Georgia, where Joe Downey is giving exhibition flights.

The MINEOLA SPECIALTY COMPANY, Mineola, L. I., showed a Curtiss-type biplane complete, but without power-plant. This had a single surface front elevator, Farman type ailerons, double surface planes, and all metal parts and fittings were finished in oxidized copper and lacquered.

Every detail of construction was carefully executed, and the general finish of this machine was equally as fine as any on the floor.

The steering-post was rather a novelty, being built entirely of steel, the cable running inside of the Shelby steel post. The front control, rear stabilizer and rudder are arranged to knock down readily, as well as all the plane sections.

BUTLER & SAUNDERS, of 341 Newbury St., Boston.—This monoplane was a rather close copy of the Bleriot cross-Channel type, with a 3-cycle Anzani motor, with the exception of the alighting gear, which was built somewhat along the lines of the "Farman," with the exception of there being two wheels in place of four. Naiad cloth was used to cover the planes, and, considering that the machine was built in a barn, with the door open to let in a little daylight, which at the same time let in plenty of winter atmosphere, and with very few tools at hand, it certainly was a most creditable piece of work.

Nat Butler, who is well known as an exbicycle rider, did most of the work on the machine. He intends to start work very shortly on a new Bleriot-type racing machine, which will be equipped with either a Gnome or an Indian revolving motor. The main frame or fuselage will be constructed in such a manner that there will be no holes bored through it, and the alighting gear will be similar to the one they are using on their present machine.

THE BOSTON AERO CO., 410 Newbury St., Boston, Mass.—Their "Pigeon Monoplane" faced the entrance to the hall, and was one of the most novel machines shown. The workmanship was fine. It was considerably larger than any of the other monoplanes, spreading 36 ft., and nearly as big as the Antoinette.

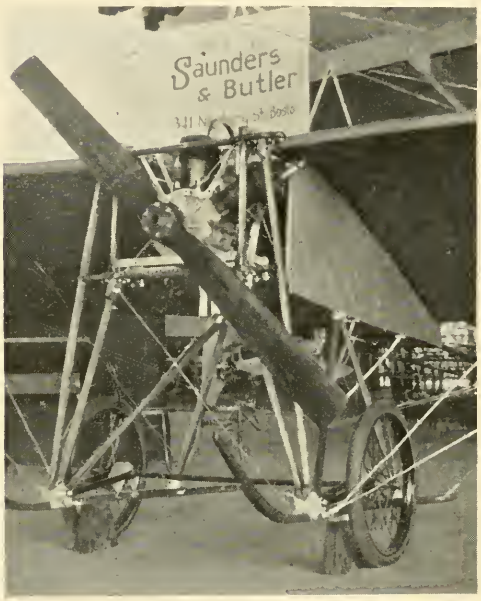
The framework (fuselage) was built of hollow spars, as well as the entire edge of the wings. The wings were pivoted in such a manner that when one was raised the other was automatically lowered, within a range of 4 to 18 degrees. The whole wing surface's angle of incidence could also be altered during flight.

The operating of the wings in this manner was designed to be automatic, but can also be controlled by the aviator from a wheel.

A 6-cylinder motor, 4⅜ by 5 in. b. and s., of the revolving type, similar in appearance to the Gnome, was installed, for which great power and reliability are claimed. The correct timing of a 6-cylinder rotary motor would seem to offer some difficulty.

This was designed and built by Albert A. Gouldhart.

The LONGFELLOW MONOPLANE CO., of Allston, Mass., exhibited their first monoplane, Bleriot type with a very nice looking running gear. This was fitted with a new engine, an "Avis," 30 h. p., 2 cylinders, 2-cycle, revolving.



Business End of Butler-Saunders.

This machine spreads 24 ft, covered with Naiad cloth. The vertical struts in the body framing are of oval steel tubing.

HARVARD AERONAUTICAL SOCIETY.—This society showed the H. V. Roe triplane which Roe brought over for the Boston aviation meet.

HUBBARD MONOPLANE.—See elsewhere, this issue.

Engines and Accessories.

ELBRIDGE ENGINE CO., 10 Culver Rd., Rochester, N. Y., had four engines on exhibition: one 3-cyl., two 4-cyl. and one 6-cyl. The 4 and 6-cylinder motors were the new "Aero Special." One was shown mounted in a section of a Wittemann 'plane, with twin El Arco radiators, Bosch magneto and Gibson propeller. Another engine was fitted with a "Paragon." Of course, the G. & A. carburetor was shown as standard equipment.

HENDEE MFG. CO., Springfield, Mass. First showing of their new 7-cyl. rotary "Indian." The "Model D" Burgess had the 8-cyl. "V" Indian.

AMERICAN PROPELLER CO., 616 G St., Washington, had a comprehensive exhibit of their well and favorably known "Paragon" propellers.

MARBURG BROS., 1771 Broadway, New York. American agents for the Mea, had an exhibit of their own as well.

GOODYEAR TIRE & RUBBER CO., Akron, O. This company had a large exhibit—showing a complete line of detachable aeroplane tires and several grades of fabrics. Of special interest was the new "Wing" fabric which the Wright Company is now using on its machines, as well as the Burgess Co. & Curtis. This fabric is not affected by either heat, cold or moisture, and was only accepted by the Wright people after strenuous tests. This costs from $1.00 to $1.50 a yard, according to width and weight. Goodyear tires can be had now in a great variety of sizes. The new 20x4 is perhaps the best size for aeroplane work. There is a decided advantage in tires of large cross-section.

PENNSYLVANIA RUBBER CO., Jeannette, Pa. Their yellow fabric, "Penacloth," of a weight of but 6½ oz. to the yard, and the big 4x20 in. tires, the first of the size on the market, were handled by the Post & Lester Co., of Boston.

B. F. GOODRICH CO., Akron, O., exhibitors of "Palmer" tires and rubber shock absorbers for Wright and Farman-type running gear. Palmer tires are all single tube and, of course, lighter than casings and inner tubes.

One tire shown had Chrome leather vulcanized on the tread. The arrangement of the fabric, the threads in each layer being at an angle of 45 degrees to the other, makes the tire cling closely to the rim and avoids the use of clincher rims. These can now be had in the 20x3 size.

Supply Houses.

CHURCH AEROPLANE COMPANY, 123 Smith Street, Brooklyn, N. Y. This company, which is one of the oldest in the business, showed a very complete line of supplies and fittings. Some of the finished spruce parts, such as ribs, struts and main spars, were well designed and beautifully finished.

They had intended to have their supply catalog ready some time ago, but, before going to press, decided to add several of their new fittings, as well as model sundries, and so have held this back until cuts can be made. This catalog is promised for the very near future.

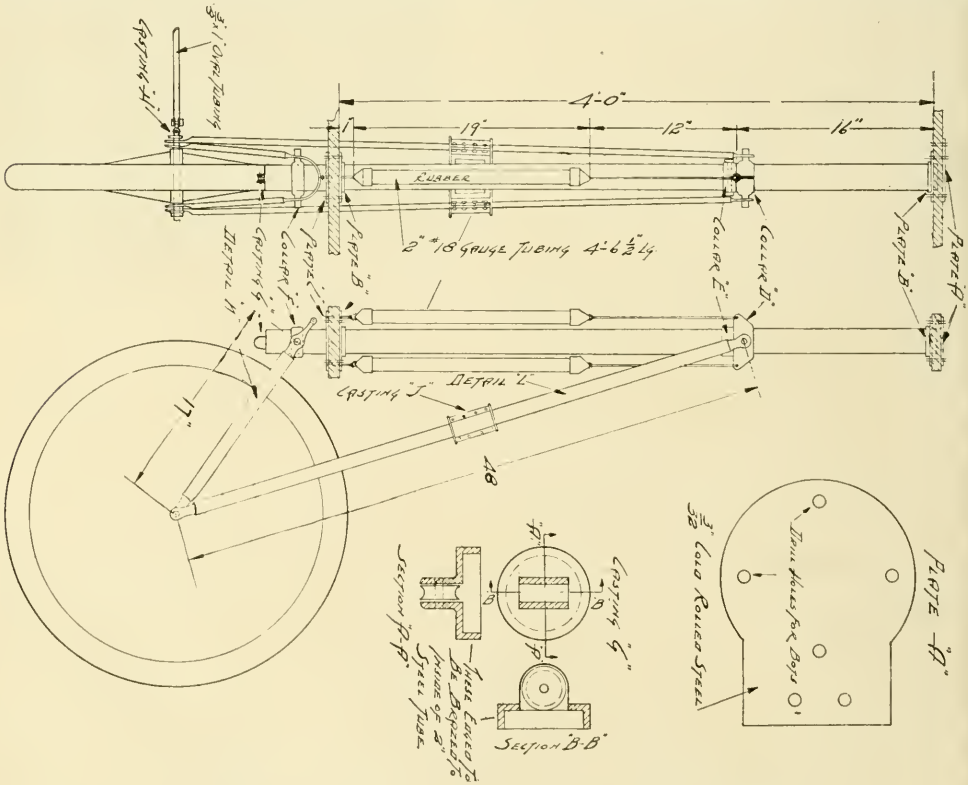
They also exhibited a Bleriot-type monoplane in the course of construction. This was made almost entirely of spruce, being designed particularly light to accommodate the "Avis" motor which the Longfellow Aeroplane Company is putting on the market.

The monoplane showed good workmanship. The wings, which were shown uncovered, were perfectly lined up, and the novel feature of these was the front entering edge, which was of half-round, hollow spruce, instead of the sheet aluminum as is generally used, and which gets quickly dented and twisted out of shape in handling.

This company also had a very fine display of "Paragon" propellers, for which they are the Brooklyn agents. In fact, theirs was the only real display of propellers in the show. Several sales on these were reported, one of their customers being Victor Lougheed, author of "Vehicles of the Air."

E. J. WILLIS CO., 85 Chambers St., New York. The Willis exhibit was as complete as usual. In addition to the hundred or more various fittings the company showed Naiad cloth, Hartford tires and Weaver wheels, Gibson propellers, ribs, struts, G. & A. carburetor, Pennsylvania wheels and tires and El Arco radiators. A duplicate "Aeromotor" of that on the Yamada Japanese airship attracted attention. This was shown with a Mea magneto.

THE AMERICAN AEROPLANE SUPPLY HOUSE, of Garden City, N. Y., had an extensive exhibit of well-made parts for Bleriot-type machines. One whole wing was shown, with rudder and elevator, uncovered. This



Bleriot Front Wheel of Am. Aeroplane Supply House.

concern has prepared a complete set of scale and full size drawings of every part of the cross-Channel Bleriot, as well as being in a position to sell all parts ready for assembling at a low price.

E. L. LENNON & CO.'S booth showed Wilson & Silsby cloth, the Custer statoscope, Goodyear rubber shock absorbers, and claimed to handle Gnome engines and Chauviere propellers. Some samples of Bleriot turnbuckles were shown. These were novel, in that the threaded ends of the sleeve were split to keep the threads on the eyebolts from stripping. The Custer statoscope is very simple and sells for $25. A full description was published in AERONAUTICS.

N. Y. AERONAUTICAL SUPPLY CO., 50 Broadway, New York City. This company showed a line of supplies of every description. They have just issued a 20-page catalog, which shows many standard fittings. They also showed one of the new 50 "Aerometers" for which they are the New York agents. Their exhibit was most complete and included, among other things, Gibson propellers, Curtis and Farman running gear, Curtiss seats, Bleriot fittings, Naiad cloth, "Carrath" oval tubing, El Arco radiators, square tubing, made-up ailerons, etc. This concern has been started by Walter Shulman, formerly with the E. J. Willis.

Models and Miscellaneous.

WHITE AEROPLANE CO., 15 Myrtle Ave., Brooklyn, N. Y., showed a big line of models and model supplies.

ROYAL AERIAL MFG CO., West New York, N. J., was another exhibitor of flying models.

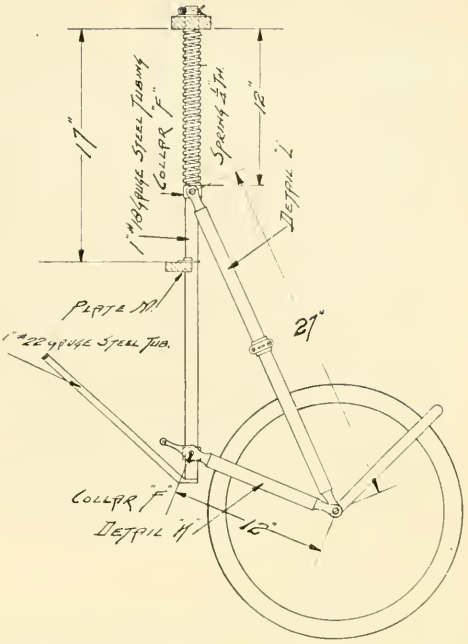
A. C. MARQUIS, of Rochester, N. Y., showed a compass particularly adapted for flying. A mirror showed the direction being flown on a vertical dial. Another feature is that, to the operator of the aeroplane, the needle points in the direction in which the machine is flying, instead of continually pointing to the north as usual. The dial apparently moves instead of the needle.

THE SCIENTIFIC AEROPLANE CO., 125 East 23d St., New York, exhibited the Sperry gyroscope, intended for use in aeroplanes to preserve lateral stability. Mobiloil was handled by a local automobile firm, as was Pan-O-Lite oils and grease.

The Tufts Aero Club showed a member's glider. Cole & Co., Asbury Park, photographs. Pittsfield Aero Club, balloon basket. C. J. Seamon, flying novelties. Magazines, AERONAUTICS, Aviation Topics, Aircraft, Fly, Aero.

The **U. S. Aeronautical Reserve** had a booth for their organ, Airscout. The Boston Globe was an exhibitor of models. The Aeronautical Society had a booth, and L. E. Dare filled the space with an interesting collection of models and photographs. The Aero Club of New England was represented.

Exhibitors of models were: International Airship Co., 50 Congress St., Boston; A. L. de Dryver and Edw. Huber; Harriman Aeromobile Co., 53 State St., Boston.



Bleriot Tail Wheel Made by Am. Aeroplane Supply House.

Each day during the week of the show lectures were given, free to the spectators at the hall. These talks were given by Augustus Post, J. Emory Harriman, Prof. H. H. Clayton and Albert A. Merrill.

Samuel F. Perkins, who has been flying his man-lifting kites all across the continent and from the deck of U. S. warships on the Pacific coast, flew kites from the roof of the building during the show.

In a second attempt to make a trans-Hudson flight from Guttenberg race track in New Jersey to Central Park in New York City, on February 24, Chas. B. Morak alighted in the middle of the Hudson River and was carried down into the water with the machine. He caught his shoe somewhere on the machine and tore it off in getting loose. The Sheider aeroplane immediately sunk and was never found. It was fitted with a new 8-cylinder engine loaned for the occasion by Frank Boland, of Rahway, N. J.

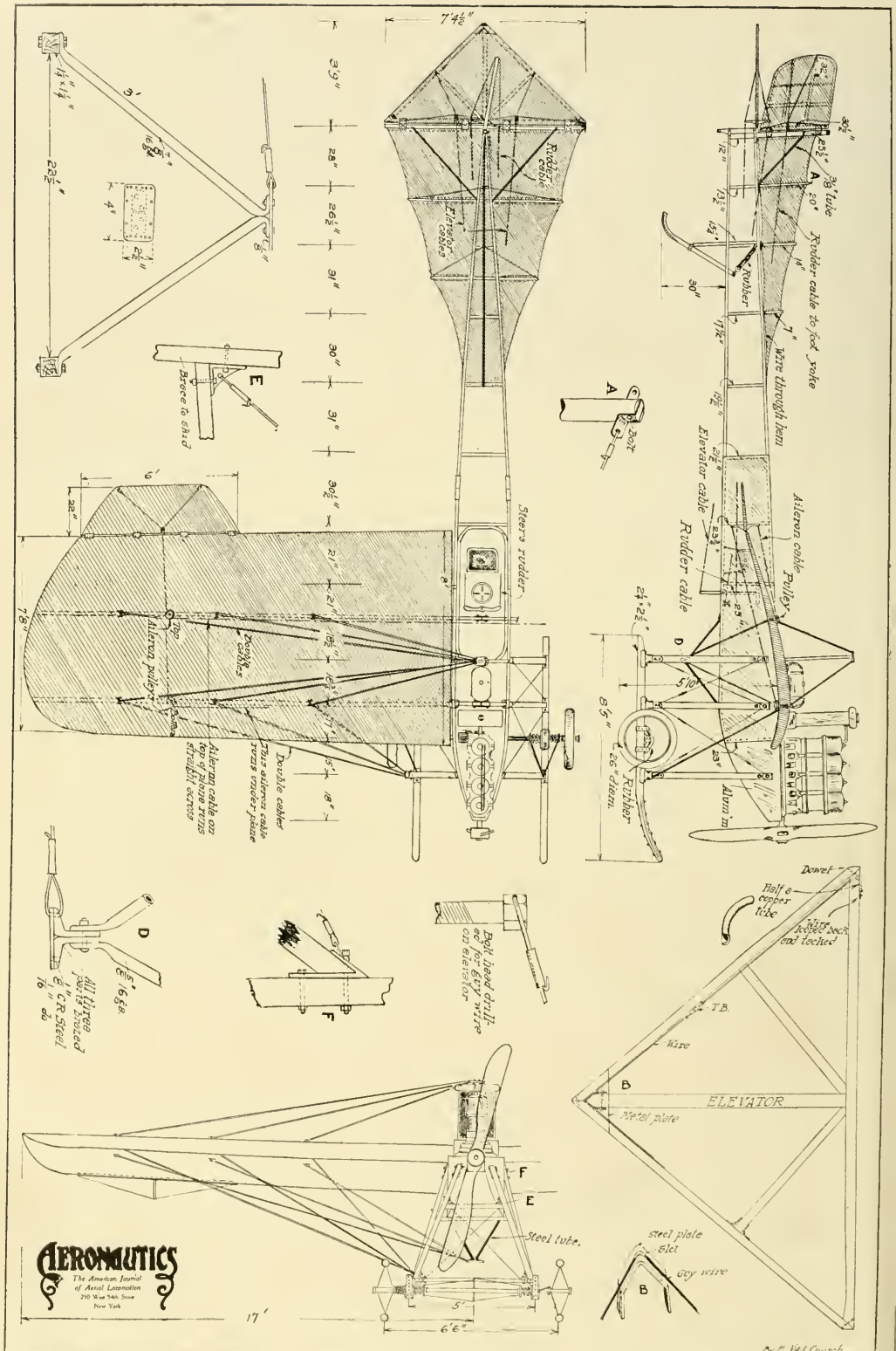
The previous flight ended after flying a mile or so from the grounds.

THE HUBBARD MONOPLANE

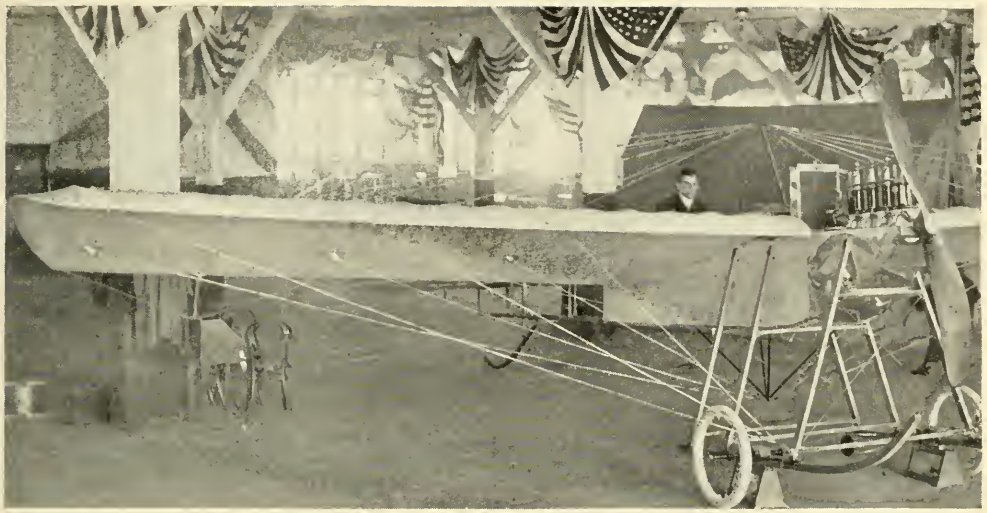
G. GARDNER HUBBARD and F. Tracy Hubbard, of Ipswich, Mass., are new makers of aeroplanes, putting on the market a monoplane, type "Hubbard IV." A special feature is its ease of assembling and taking down. It can be put up in two hours and disassembled in a half-hour less. It is a sturdy looking machine, combining prominent features of several well-known machines.

The wings resemble those of the Bleriot, and the same for the body framing. The aluminum-covered nose and placing of the engine is that of the Tellier, the running gear looks like the Hanriot, and the horizontal tail and elevator takes after the Antoinette. The skid under the tail is like that under the Farman. The two-wheeled arrangement will probably be replaced by a four-wheeled truck, with the wheels arranged similar to the Farman.

Of its predecessors, one of which had a Gnome engine, No. 1 and No. 3 flew. The other was smashed in a trial and was not rebuilt on the same plan. The first machine was



The Hubbard Monoplane



Hubbard Monoplane

built in 1909 by F. W. Baldwin and J. A. D. McCurdy at Baddeck, Dr. Bell's summer place.

Planes are covered with either Naiad cloth or Wilson & Silsby fabric. Spread 34 ft. and are 8 ft. fore and aft at greatest dimension. These are guyed to the running gear by double Roebling cables adjusted by turnbuckles of fine design. There is a slight dihedral angle to the wings, 1.5 cm. to the meter. The fabric, where necessary, is laced; not through eyelets, but around hooks.

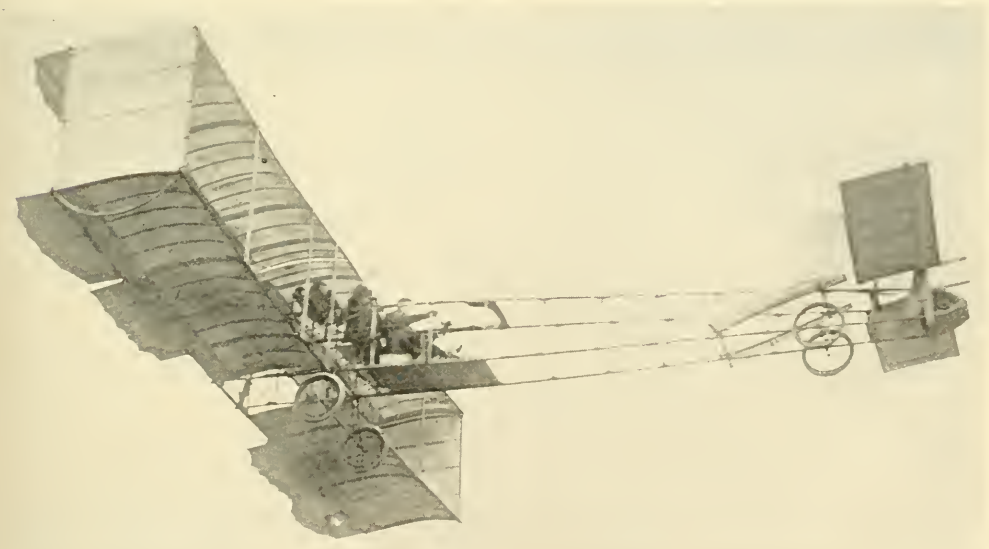
Stability is secured through ailerons hinged at the outer rear beam of the wings. These are operated by cable over pulleys and are interconnected so that when one is pulled down the other is pulled up, as in the Curtiss.

Power Plant. Elbridge "Featherweight" engines of 40 h. p. and El Arco radiator. Gibson propeller. Mr. Hubbard is enthusiastic about his engine, which he bought second-hand and was tested on the block for an hour and gave 48.7 h. p. average.

Control. This is by means of a post mounted on a unique universal joint with wheel at the top. This is used for the elevator and for the ailerons. The rudder is operated by the feet. The post is swung from side to side for the ailerons; in fact, it acts exactly as the Bleriot control.

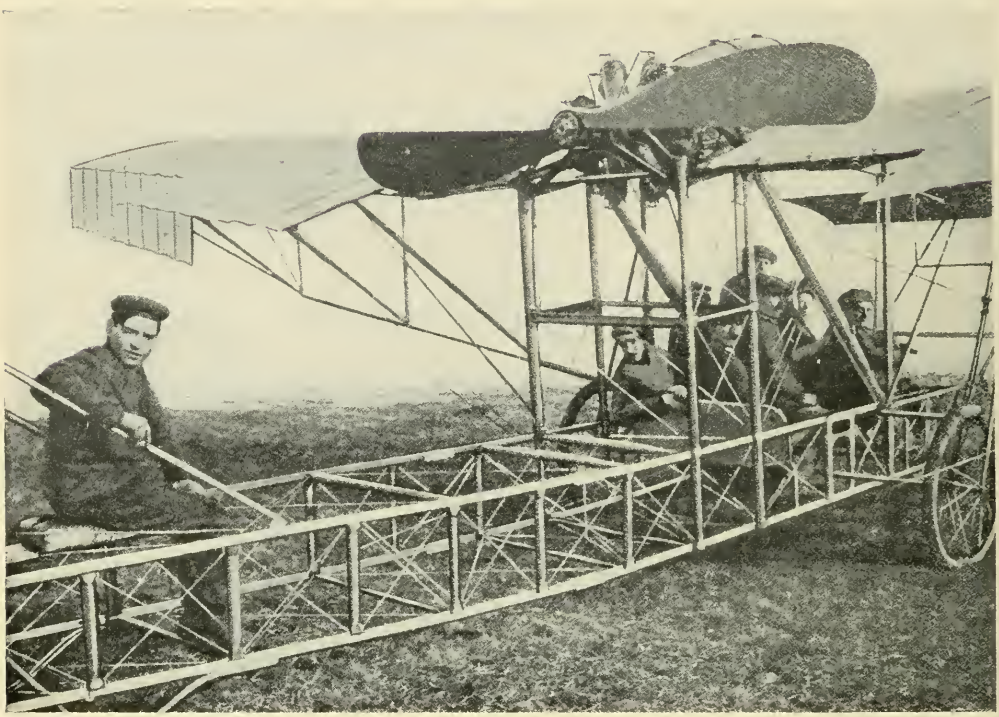
Running Gear. The wheels are Goodrich, 26x2½ in., with Goodyear Farman-type shock rubbers.

The total weight is about 700 lbs.



The Voisin "Tailless" Biplane

NOTES FROM ABROAD



New Bleriot XIII Carries 8 People

RENAUX WINS $20,000 PRIZE.

Eugene Renaux, on March 7, won the $20,000 Michelin prize offered three years ago for a passenger flight from Paris to the top of Puy de Dome, near Ciermont-Ferrant, France. This mountain has an altitude of over 4,800 feet and the only available landing space is a small plateau about 360 feet by 131 feet. He used a Maurice Farman biplane with a 60-h.p. Renault 8-cylinder air-cooled motor of the same type as now holds the Michelin Cup for distance.

The distance from the starting point to the landing point is 350 kilometers (217 miles). The total time consumed in making the flight was 5 hours, 10 minutes, 46 seconds; maximum time allowed under the regulations being 6 hours. He made one stop at Nevers for the purpose of replenishing oil and gas. Two previous attempts have been made to win this prize, one by Weymann, who lost his way, and the other by Morane, who met with an accident.

THE BLERIOT XIII.

From long distance flying to weight carrying is the step recently taken abroad, following the wonderful cross-country flight of Capt. Georges Bellenger (Bleriot 50 h.p.) from Paris to Pau, in the Pyrenees, 680 kilometers (421 miles), in the flying time of 7¼ hours.

Cody, in England, has carried three passengers, one of whom stood up and clung to a strut; Busson has carried three passengers in his 100-h.p. Deperdussin; Weymann and H. Farman have both made flights with five passengers.

Lemartin, with a new Bleriot monoplane, Type XIII, has flown for 8 minutes with seven passengers, and it is claimed the machine can carry 10 people.

The photograph shows this new machine. Note the elevator is in front and the motor and propeller at the rear of the main plane.

The plane spreads 42½ ft., and has 430 sq. ft. The engine is a 100-h.p. Gnome. The weight of the machine itself is 1,323 lbs. The weight of the eight people was 1,102 lbs., so that the weight per square foot was over 5½ lbs., and the weight per horsepower over 24 lbs. For lack of space we are compelled to omit details.

Sommer has also carried great weight, in the shape of six passengers, with 602 sq. ft. of surface in his biplane, which is perhaps at this moment the most attractive in France.

THE TAILLESS VOISIN.

The new Voisin machine, which looks as though it were flying backwards, is indeed a curiosity. First, we have headless aeroplanes, and now tailless, and next we will have neither head nor tail—maybe.

One first thinks of the first aeroplane that Santos Dumont flew, his "14-bis." Note the elevator in two parts, the rudder above. Forward and back movement of the steering wheel post operates elevator, and turning the wheel operates the rudder, while the feet command the ailerons. The motor is a 50-h.p. Gnome, driving a metal propeller.

140-MILE SEA FLIGHT.

On March 5 Lieut. Bague established a new water record, and it was unadvertised and no boats were strung along the route. He had to fly by compass from Nice to the Island of Gorgona, between Corsica and Italy. He intended to land in Corsica, but lost his bearings. A closer figuring by Mr. Williams Welch puts the distance at 138 miles. Bague used a Bleriot 50.

WASHINGTON AEROPLANE SHOW

By W. Wilson Southard and Antony Jannus.

THE first annual aeroplane and motor truck exhibit was held in Exhibition Hall under the auspices of the National Aviation Co., during the entire week of March 5-12.

While probably not one of the largest shows, and exhibits did not arrive on time, it was instructive to the uneducated mind in the highest degree. Most of the aeroplanes were biplanes, but of quite a varied and interesting assortment.

The National Aviation Co. showed standard Curtiss biplane, of the "Type 1," equipped with the 4-cylinder motor. This machine is to be used in teaching at the company's aero school. It was recently purchased from Glenn H. Curtiss for this purpose.

Harry A. Orme had a beautiful looking biplane which is more of a pocket edition than the "Baby Wright" at the Belmont meet. Is a locally constructed machine, with single elevator in front. Its peculiarity consists in an umbrella-shaped plane over the center of the two planes and intended to preserve equilibrium. The ends of this are to be warped down to preserve lateral stability, but as the plane above named is small, it is questionable if the leverage obtained will cause sufficient reaction to do any balancing at all, and is perhaps the weakest feature about the machine. Vertical fins, instead of being in front as in the Wright machines, are placed on the back ends of the skids. The rest of the machine is typical of the older Wright machines, with two propellers and two seats left of the motor.

A tiny motor of about 10 h.p., probably placed in it for exhibition purposes, will, it is reported, be replaced by one capable of 30 h.p., and the machine tried out in the near future.

The Wright Co. exhibited one of their standard headless big machines and attracted quite a little attention, probably because of the recent record cross-country flight of Parmalee. This was the same handsome machine seen at the Boston show.

The Hubbard monoplane Model 4 was shown. This machine, while it has not yet been tried out, is patterned after its predecessors, which have and is only awaiting one of the Hubbards' return from Europe for its trials. The wings of the old machine were recovered and while a landing chassis of the Farman type is adopted, the machine is a combination of the Bleriot, Antoinette and Hanriot.

A standard 4-cylinder Elbridge engine was shown, with a Gibson propeller.

The Rooney triplane proved quite original and appears practical if it were not underpowered—a frequent mistake. It resembles two triplanes in tandem with the motor between mounted near the middle on the chassis which is supported on four wheels. An engine of about 15 h.p. is used, but will be substituted by a larger one later. It has made several jumps, but has not achieved a practical success yet.

The plane construction of the Rooney machine is unique and is the subject of one of their patents. They only exhibited this old machine under protest, but they have some sample constructional details of the new Rooney which indicate that No. 2 will be a wonder in structure and performance.

The Rex Smith Aeroplane Co. had a complete machine exhibited and showed their second in the course of construction. This machine has been making a series of successful flights at College Park lately, piloted by Antony Jannus. Readers of AERONAUTICS are already familiar with it.

The power plant consists of a 100-h.p., 300-lb., 2-cycle Emerson motor in conjunction with a 9-ft. Paragon propeller. Mea magneto and Hopkins electric tachometer..

Running the big Emerson six in the Rex Smith machine proved quite an attraction, as it nearly blew everything out of the building and people were forced to stand in front of the machine to get out of the dust. As the hall is cement floor and steel construction, there has been no objection to running around with autos or running aero motors.

Only two makes of motors were shown, the Fox de luxe and the Emerson, both of which attracted considerable notice.

The Selby Co., the local agents for the Fox motor in Washington, D. C., exhibited several sizes of Fox motors, comprising the 2-cycle, 30-h.p. aero motor, weighing 130 lbs.; the 2-cycle, 80-h.p., weighing 250 lbs., and two sizes of marine motors. Mr. Selby reports the sale of a 6-cylinder, 49-h. p., aero motor to A. E. Barnett, of Providence, R. I., to be used in a Farman type biplane.

Two aero motors were shown by the Emerson Engine Co., of Alexandria, Va., 100 h. p. and 70 h.p. The 100 h.p. weighs 300 lbs., and the 70 h.p., 196 lbs. These motors are 2-cycle, 5-in. x 5-in., and are 6 and 4 cylinders, respectively.

The model booths were quite an attraction and it was deemed quite commonplace to see a man or woman make a quick duck to escape figuring in an aeroplane accident at the hands of some enthusiastic juvenile aviator.

The Mineola Aero Specialty Co. had their Curtiss type. This is a beautiful machine with oxidized metal fittings and neat double-surfaced planes. The Aeronautical Reserve recruiting tent came next, with the Paragon exhibit beyond.

The American Propeller Co. had an even more impressive display of Paragon propellers than was shown at Boston. Of special interest was a 3-blade Paragon of original structural design for which great strength is claimed.

The motor truck show attracted equally as much attention as the aeroplanes, and a varied, up-to-date assortment was shown by the leading motor truck firms.

Financially the show was not as successful as was anticipated, but a fair attendance attested to the interest in aeronautics of the Washington populace and their visiting friends.

Spectators at the Boston-Harvard meet will be interested to learn that Prof. Jimmy V. Martin, formerly of the Harvard Aeronautical Society, has secured his pilot license at the C. G. White school in England, flying a Farman. The perfectly good Roe triplane, purchased by the Harvard Society and heretofore apparently beneath the professor's notice, may now receive even more consideration than was bestowed upon the "Harvard 1," alias "the groundhog." All this by way of airyness.

Three senior University of Minnesota men are working on a monoplane which is under construction in the mechanical engineering building at Minneapolis.

W. S. Romme, who has been building a unique monoplane during the winter and gave it some initial trials at Belmont Park on the snow with a small motor, has removed it to San Antonio, Tex. He is a member of the Aeronautical Society and his first small model attracted great attention by its stable and slow flying at the Automobile Club. The model was nicknamed the "Merry Widow," for it resembled greatly the hat of that name. Imagine a shallow pan with the bottom knocked out, put a propeller on one side and a rudder at the other, running gear—and there you are!

Experience costs a heap more than book learning, but it sticks in the head longer.

Some men fly high for years and now an old busted glider makes them Gun-Shy.

—Automobile Training School.

J. C. Mars Flying in Honolulu.

MEXICO CITY, Feb. 23-March 8.—The Moisant International Aviators gave a very successful series of flights. The army was very much interested and March 3d was devoted to the use of the aeroplane in connection with army maneuvers, a sham battle being one of the attractions offered.

On the opening day, Simon flew for half an hour at an altitude of 3,000 feet above the field. Garros, the same afternoon, flew around Chapultepec Castle, remaining in the air 48 minutes and reaching an altitude of 4,000 feet above the field. Barrier flew 25 miles across country around a point 12½ miles from the starting line. Alberto Braniff, the son of a banker, who has been making short flights in a Farman for the past two years in Mexico City, also flew during the visit of the Moisant aviators. The Demoiselles were not able to do much in the way of flights at the high altitude. The silver trophy, offered by the Mexican "Herald," was given to Garros for his flight of March 2, when he attained an altitude of 4,879 feet above the aviation field.

HIGHEST ALTITUDE EVER REACHED BY AEROPLANE.

Adding this to the altitude of the aviation field, 7,861 feet, makes the height reached above sea level 12,740 feet, which is the highest point yet reached by an aeroplane. The measurement of the altitude was made by a barograph. This is unofficial, but the figures are those sent to New York by A. J. Moisant. These are being verified.

Braniff was able during the meet to fly 6 kilometers from aviation field when he was forced to alight and was unable to return. On this occasion he had with him as passenger Capt. Salvador Vravo, an army officer. Joe Seymour is flying with the Moisant aviators now, and Frisbie, who could not fly at this altitude, sent up a chain of man-lifting kites.

E. L. RAMSEY.

MONTEREY, Mexico, Feb. 20-21.—The first flights in this city were made by the Moisant aviators, Simon, Garros, Frisbie and Barrier.

A. J. Moisant keeps up a most creditable system of records of all flights made by his aviators. Adding up the flights made at Mexico City, the total is more than 9 hours.

EL PASO, Tex., Feb. 10-15.—Two days' high winds prevented flying by the Moisant International Aviators. Good flying was done by Garros, Hamilton, Simon, Barrier. Frisbie failed to get off and Audemars smashed his Demoiselle. On the 14th, Simon flew for 29 minutes across the border to Juarez and back over the battle lines of the Federal and Insurgent armies. He was closely followed by Hamilton in his Curtiss-copy biplane, in a flight of 21 minutes.

VERA CRUZ, Mexico, March 11-13.—It has been impossible to obtain reports in time for this issue. From here the Moisant aviators go to Havana, March 18-26, following which is a tour of four weeks in Cuba.

TAMPA, Fla., Feb. 19-March 1.—McCurdy and Beachey gave exhibition flights at the Census Celebration. Several flights were made by Beachey at night with the aid of searchlights and bonfires, and on one occasion he carried an acetylene light on the biplane itself. Beachey also flew over the city.

ORLANDO, Fla., March 2.—Beachey flew.

OCALA, Fla., March 4.—Beachey made flights.

RECEIVES WIRELESS MESSAGES.

PALM BEACH, Fla., Feb. 24-March 6.—J. A. D. McCurdy devoted a week of flying for the enjoyment of Palm Beach's fashionable guests. Several flights were made over the pier and the hotels. Percy G. B. Morriss, a Marconi engineer, made a flight with McCurdy and was able to receive messages from Key West and from a steamer off the coast. This is the first time that wireless messages have been received on an aeroplane, in this country at least. William F. Whitehouse was a passenger on one occasion and Capt. Hugh L. Willoughby, who has his winter home at Sewalls Point, was present.

WILMINGTON, N. C., March 9-11.—McCurdy and Beachey gave exhibition, Beachey flying over the city.

FLORENCE, S. C., March 16.—Beachey flew.

CUBAN TOUR—After the close of the Havana meet by Curtiss aviators, McCurdy flew one day at Colon before leaving for Florida. Ward then made a tour of several Cuban towns, Cienfuegos, Caibarien, Santa Clara, Santiago, Caimanera, Chaparra, Camagua, closing March 22 at Manzanillo. As Caimanera is near Guantanamo, where the American fleet is stationed, Ward flew for the benefit of the sailors at the latter place.

ACCIDENT AT SHOW.

VALDOSTA, Ga., March 2-4.—William Mattery, a former airship showman, attempted to give exhibition flights here. On the first day he was able to fly his biplane but 100 yards, and on the second day the wind caught him and the machine was wrecked and Mattery went to the hospital. Joe Downey, in a Bleriot, with Anzani motor, did not do as well as the biplane. Ray Harroun was also there with his new monoplane.

AVIATOR PAINE INJURED.

BRIDGEPORT, Ct., March 3.—Frank Paine, a Bridgeport man, fell in his Curtiss-copy biplane and was sent to the hospital.

After learning to fly at Mineola, with an Elbridge engine which he hired from "Pete" McLaughlin, a local hotel keeper, in whose charge the engine had been left, Paine went to Bridgeport to show his fellow citizens how it was done. The city granted the use of the Seaside Park and a purse was raised for the "made-in-Bridgeport" aeroplane. He had been there a week or more trying to get off the safe turf, in which the wheels sank heavily. On one occasion he did get off, but hit a tree.

An experienced aviator would not think of trying a flight in the space this young hopeful selected, nor would he start till his engine was right. Little items like this did not bother Paine. He did not take the trouble to clean a missing plug. The crowd assembled laughed at his efforts, which might have been crowned with success through his sheer foolhardiness had he used enough judgment to get his engine hitting all around.

And now he's in the hospital. This is a shining example of the beginner who cannot wait to become proficient before beginning sensational flights, as he was promising to fly across Bridgeport harbor.

LOGAN, Utah, Feb. 27.—Clarence Walker, with his true Curtiss, was forced down by the wind, damaging his machine, in an exhibition flight which covered but a few feet.

BATON ROUGE, La., March 5.—William G. Purvis, of Chicago, unknown to aero fame, after making one successful flight, caught his wheels in a wire fence and was injured. It looks like another example of the inexperienced attempting exhibitions.

SALT LAKE CITY, Utah, Feb. 10-16.—Willard, Ely and Walker, all Curtiss flyers, made flights, despite exceedingly windy weather and snow flurries. Salt Lake City is 4,000 feet above sea level, but no trouble was had in flying, except by Clarence Walker, a local aviator, who recently bought one of the 25-h.p. Curtiss machines and learned to fly in California.

Wind blew a hurricane on the 10th. Postponed till Sunday, the 11th. Sunday the attendance was 8,000; weather was cold, and those attending were rewarded with good flights. Ely flying out to the Great Salt Lake, Willard flying closer with curves and glides. Lack of wind prevented Perkins flying his kites. Total time in air for Ely and Willard, 30 minutes.

Snow storm Monday, no flights. Tuesday, postponed. Wednesday, good flights by Willard and Ely, Ely flying through snow flurry north of aviation field. Walker got off ground for a few yards the first two attempts. The third attempt flew for ½ mile, turned, but was forced to land after turn. This, I believe, is a record for a 25-h. p. engine at this altitude.

Attendance about 3,000 Thursday. Ely flew but a short distance when he had to descend, running into a post and breaking front elevator. Willard remained in air 47 minutes, giving the best flight of meet, with spectators fully satisfied.

The weather was so cold the oil froze in the sights and actually broke the glass on Willard's machine. The oil had to be thawed out before starting.

On this, the last day, Clarence Walker flew for about ½ mile, but was forced to descend for lack of power. Mr. Walker will remain here for a while, and is now trying an Elbridge 40-60 and has purchased a Curtiss 8-cylinder engine. J. M. THOMAS.

MANILA, P. I., Feb. 21.—Capt. Thos. S. Baldwin, J. C. Mars and Tod Shriver arrived in Yokohama on January 21 on an aeroplane exhibition tour of the world. This is the first time that Capt. Baldwin has been in Japan since 1889, when he was there making parachute drops. After giving flights at Yokohama they went to Manila, where they flew on February 21. The tour has covered thus far flights in Honolulu and places in China.

On March 12 Mars and Baldwin flew at Osaka, Japan, in the presence of members of the imperial family and representatives of the government.

ASCENSIONS

CONTEST OVER LAHM CUP.

SAN ANTONIO, Tex., Feb. 24.—W. F. Assmann and J. M. O'Reilly, in an 80,000-ft. Honeywell balloon, "Miss Sophia," left San Antonio at 6:47 p. m. in an effort to break the 1,172-mile U. S. distance record made in the last Gordon Bennett by Hawley and Post, and win the Lahm cup, landing the next evening at 5:15 p. m. at Gowers, Mo., a distance of 732 miles, as measured by Mr. Williams Welch of the U. S. Signal Corps office.

This beats the distance made by Forbes and Fleischman, the second holders of the cup.

Entry was duly made by Assmann for the trial, but the Aero Club claims that the present holder is Alan R. Hawley, who competed for it at the same time he competed for the Gordon Bennett.

It is claimed by St. Louis aeronauts that there is an unwritten rule that competitors in the international event should not at the same time compete for the Lahm cup.

There is nothing in the Lahm cup rules to prevent competing for both at the same time.

It is a fact, however, if memory serves well, that it was announced by the Contest Committee of the A. C. A., just previous to the 1907 Gordon Bennett, that entrants could not compete for both; and Chandler and McCoy made a special ascent previous to the international event for the Lahm cup and won it, as noted below. At any rate, Chandler and McCoy retained the cup, though their distance was beaten by all the American balloons in the Gordon Bennett. If the Lahm cup could have been competed for simultaneously, it is most likely that someone would have entered for it.

WINNERS OF THE LAHM CUP.

Capt. Chas. De F. Chandler and J. C. McCoy, in Signal Corps balloon No. 10, St. Louis, Mo., to Walton, W. Va., Oct. 17-18, 1907, 475 miles, duration 20 hrs. 15 min.

A. H. Forbes and Max C. Fleischman in the "Conqueror," a Baldwin balloon, St. Louis, Mo., to near Richmond, Va., Oct. 12, 1909, 697 miles in 19 hrs. 15 min.

Alan R. Hawley and Augustus Post, in "America II," a French balloon sold through Stevens to J. C. McCoy, St. Louis to near Lake St. John, Que., Oct. 17-19, 1910, 1,172.9 miles, winning at the same time the Gordon Bennett cup and prize.

Ogdensburg, N. Y., Feb. 20, Mr. and Mrs. Barlatier in the "Lapresse," landing at Summerstown, Ont., in the attempt to reach Montreal.

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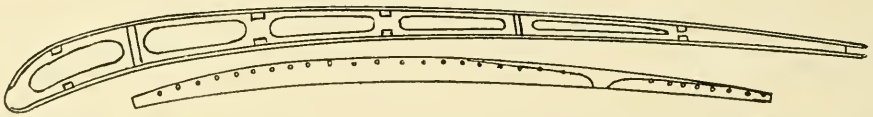

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MANY SHOWS MENACE AERONAUTIC INDUSTRY

TRADE BODY NEEDED.

AT the present stage of the aeronautic industry not more than one show a year can be supported by manufacturers of aeroplanes, motors and accessories.

In the highly developed automobile industry, at the present time, there are but three shows recognized by the national body of manufacturers,—New York, Boston and Chicago. Local dealers in their own cities have shows, of course, at their own expense, and do not draw at all on the manufacturers at large.

The automobile industry considers shows in excess of the above number too great a burden. The national association safeguards its members against unnecessary expense of this kind, and against waste of time and money which should be employed for the legitimate upbuilding of business.

The aero manufacturers have already complained of the drain upon their meagre resources caused by the shows which have been held within a year—Boston, New York, St. Louis, Philadelphia, San Francisco and Washington.

Not a single one of these shows has been anything like complete.

Chicago has had the foresight to profit at St. Louis' expense and is holding no show.

These indoor exhibitions, perhaps, do stimulate a little interest on the part of the public —but no maker can say that he made sales at these shows which he would not have made without them. Those we have asked report the shows to be non-productive when the expense is considered.

It is but natural that various clubs want to have shows held in their cities—and the desire is laudable but for the mistake in policy.

Why not profit by the experience of automobile and allied manufacturers? At least, limit the national shows to, say, New York, Chicago and San Francisco or Los Angeles.

And then, too, have the local club or clubs conduct these three exhibitions in the absence of a local trade organization. At any rate, it must be insisted upon that any show held be under such auspices as are financially responsible for all indebtedness.

NATIONAL TRADE BODY.

No national control of shows can be had until there is an organization of manufacturers. Now is none too early to begin the formation of a national trade body, "free and independent."

A national body could grant a sanction to a club or individual to hold a show, upon such conditions as will insure its success from the exhibitors' point of view, upon terms which will guarantee the absence of a trail of creditors. There will not be the spectacle of a show "under the auspices" of some local club with the club getting out from under when pay time comes.

On the other hand, national support would do much to guarantee the manager or promoter of the show from loss. Each individual member of the body should agree to exhibit. This would result in a truly representative exhibition. A large part of the expense would be covered before the doors opened by the sale of floor space. This would mean an exhibition worth the name.

It would be desirable that the national body of makers participate in the net profits, divided on the basis of floor space bought.

The membership in this national body should be limited to bona fide makers, jobbers and dealers. The questionable concern should be left on the outside. The purveyor of misrepresentations and the out-and-out fake would be put beyond the pale.

This national organization would benefit the reputable member, reassure the public, and eliminate the undesirable. A returning visitor to that dear France says: "There are legions of blackguards in France. There they do give something (for the money) but in America—no." How true this is, none but those who have been bitten can say—and they won't.

PLAN UNDER WAY.

With this idea in mind, AERONAUTICS has been instrumental in arousing interest among several members of the trade and a movement for an organization of a national character along lines which will benefit and protect the legitimate trade has already been started.

Before the next issue, which will contain full details of the plan, those interested will materially assist by communicating with AERONAUTICS, at 250 West 54th St., New York.

BANQUET OF NEW ENGLAND CLUB.

The Aero Club of New England held its first dinner of the year on February 25 at the Boston City Club, Boston. There was a large attendance of its members and many invited guests, among whom were E. H. Dandurand, Acting Mayor of Montreal and a great enthusiast in aerial navigation. He extended a cordial invitation to the members to visit his home city during this summer. Augustus Post related his interesting experiences in the Canadian wilderness during the last International balloon race. He was given a great ovation by the members of the club. Eugene Tarte, the editor of "La Patrie," was also present and donated to the club a handsome trophy, the same to be awarded to the pilot of a spherical balloon who lands nearest to the city of Montreal. Greeley S. Curtis and W. Starling Burgess made many interesting predictions regarding the development of aeroplanes.

Among the other guests of the club were representatives from all the college aero clubs in New England, Dartmouth College being represented by John W. Peason, Brown by Prof. J. Ansel Brooks, Yale by Edward B. Hine and Williams by H. P. Shearman.

Many interesting speeches were made also by Leo Stevens, Charles J. Glidden, H. H. Clayton, president of the club, and by William H. Hilliard.

The club is in a most flourishing condition, with a large waiting list. The officers of the organization are: H. Helm Clayton, President; Nathan L. Amster, First Vice-President; J. Walter Flagg, Second Vice-President; Harry G. Pollard, Treasurer; Alfred R. Shrigley, Secretary.

MEMBERS CAN LEARN TO FLY.

The committee on contests of the A. C. of New England is announcing flight lessons may be taken at the Squantum field on Burgess-Curtis machines at $500 for 20 lessons.

The balloon season will open at Lowell about April 25. Five trophies have been offered through the club as follows: To the member making the greatest number of flights; member making the longest flight in a balloon not exceeding 40,000 cubic feet capacity; member maintaining the longest equilibrium in a balloon; member making the greatest number of landings in the Province of Quebec; member landing in Canada nearest to the city of Montreal.

All to be completed for during the year 1911. These trophies may be competed for by any college aero club in the New England States.

ALFRED R. SHRIGLEY.

The Texas Junior Aeronautical Association has been formed at Fort Worth, Tex., with Hugh Dumas, president; Walter Truax, vice-president, and Robert E. Abey, secretary-treasurer.

BANQUET OF NORTH ADAMS CLUB.

The North Adams Aero Club had an enthusiastic banquet on March 10, attended by 30 members, all of whom have made balloon ascents. There were visitors from out of town, among whom were Wilbur R. Kimball, A. Leo Stevens, of New York; W. H. Richardson, of Brattleboro, Vt.; H. P. Shearman, of Williams College, and others. It was decided at the banquet to organize a national organization composed only of men who have been in the air. The decorations included the Bishop Cup, awarded Leo Stevens for the longest ascent made from New England, and small balloons labeled "Conqueror," "All America," "Cleveland," etc., to show the number of different balloons which have made ascents from North Adams.

An arrangement has been made between the North Adams and the Pittsfield clubs so that ascents may be made from either place on short notice. W. R. KIMBALL.

The Aero Club of Mexico was formed in Mexico City during the aviation meet by prominent capitalists, with Gen. Porfirio Diaz honorary president; honorary vice-president, Gen. Gonzalez Cosio, Minister of War; Alberto Braniff, president; Fernando Teresa, first vice-president; Ignacio de la Torre, second vice-president; Myrtill Schwartz, secretary; Edmundo Schwob, sub-secretary; Manuel Buch, treasurer, and the following vocales: Tomas Braniff, Garcia M. Tornel, Juan de Lara, Carlos Muller, Enrique Fernandez Castellot, J. Lopez Negrete, Luis Reyes Spindola, Paul Hudson, Ernesto T. Simondetti, J. J. Mendez, H. G. Gerber and Miguel Lebrija.

The club will be composed of two kinds of members, proprietary and ordinary members. Membership of the first class will be limited to 50 and will cost $500 entrance fee. For ordinary membership $100 entrance fee will be charged and monthly dues to the amount of $15 per month. Applications for membership must be indorsed by two or more prominent citizens of the city and forwarded with the entrance fee to the secretary, at 6a. Calle del General Prim, No. 128, Mexico, D. F.

E. L. RAMSEY.

The Milwaukee Aeronautic Club has been formed with Sherman Brown, manager Davidson Theatre, president. It is composed of about 60 of the representative citizens of that city. This is the second club in Milwaukee.

J. K. D.

The Rhode Island Aeronautical Society, Providence, R. I., has been formed by about 40 in the Engineering building of Brown University. The officers are: President, Prof. J. Ansel Brooks, of Brown University; secretary, John J. Long, an instructor in the engineering department of the college; treasurer, Victor W. Page, mechanical expert for the "New England Automobile Journal." Directors: the officers and Ernest B. Farnham, William J. Rice, Geo. W. Prowse and Ernest Whittaker.

It was voted after considerable discussion that the society should be independent of any other aeronautical organization and should be composed of men from all parts of the State who are interested in air navigation.

As soon as the Aero Club of America was spoken of someone suggested that that was mainly a sporting organization, and that it would be expensive to join it. "I think an independent organization would be far more beneficial to us." JOHN J. LONG.

FIRST BANQUET, CONNECTICUT CLUB.

The Aero Club of Connecticut's club book is now on the press. The list of members totals already 139, comprising the most representative men in Connecticut. Four members have bought Wright machines and one of these is now abroad acquiring knowledge of aviation. The first dinner of the club will be held at the Stratfield Hotel, in Bridgeport, on April 20. As soon as the season is favorable, it is planned that every member shall actually get in the air, either in his own machine or as a passenger.

The **Aero Club of America's** annual banquet will be held Wednesday, March 29, at the St. Regis hotel.

AERONAUTIC SOCIETY'S MONUMENT AND MEDAL.

The Aeronautical Society's regular meeting held February 23, adopted unanimously three

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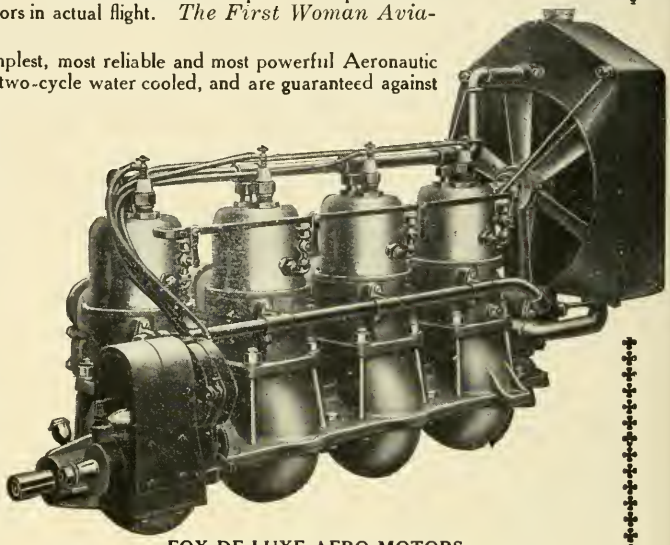

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important resolutions, moved by Thomas A. Hill: The Directors were authorized to prepare a gold medal for presentation for the most notable achievement in aeronautics. The second motion eulogized Mr. Glenn H. Curtiss for his achievement with hydro-aeroplane by rising from and alighting on the water at San Diego, Cal., and putting him in the list for the Society Medal to be awarded for notable achievements in 1911. The third resolution authorized the appointment of a committee of notable citizens throughout the country to accept funds for a monument to be erected at Washington, D. C., to the notable martyrs in the conquest of the air, Lieut. Selfridge, Ralph Johnstone, J. D. Moisant and Arch Hoxsey, and to make this recognition a national movement of sympathy to appeal to all sections of the country to join in the movement.

Among the speakers of the evening Dr. Thaddeus P. Hyatt related "Aerial Reminiscences of the Art of Flight." His father offered in 1857 $1,000 as a prize for any heavier than air machine that could stay off the ground for one minute. He built various apparatus in the form of surfaces attached to his body on the style of Lilienthal but did not meet with the same degree of success.

Henry J. Winter described methods of making aeroplane accessories and detailed construction illustrated by samples of wooden struts and ribs, also steel sockets and other details in a very interesting manner after which there was a debate and discussion regarding experiences by different members.

At the meeting of the Aeronautical Society held March 9, Mr. George B. Gifford, one of the chemists of the Standard Oil Company, gave a most enlightening address on gasoline and lubricating oils, beginning with the early stages of the oil industry thirty years ago and referring to to the difference in quality of the crude oil in the various fields of Pennsylvania, Texas, Oklahoma, California and Borneo. The particularly useful information imparted was how to select proper gasoline and lubricating oils, or rather how to make sure that suitable materials were obtained for internal combustion motors. As for gasoline, the specific gravity is immaterial while the flash point should be at 125 deg. and if a little is poured in a saucer it should burn up without residue. This would insure determination whether the gasoline was adulterated or not. As for lubricating oils, the lighter colored oils, not too heavy, are the best because they would not clog up or produce carbon from the heat in the cylinders and valves. The flash point should be about 400.

Mr. George Bradt, the treasurer of the Society, addressed the meeting about motors in general and gave useful suggestions how to select a motor based on a long experience with automobiles and the constructions that do give the best results. Dual systems of lubrication and ignition were recommended and the positioning of the carburetor close to the manifold so as to maintain heat to some extent and assist in vaporizing the mixture.

The Club Rooms Committee reported on several new rooms which were discussed but not decided upon and a new committee was appointed to consider plans for providing a work shop for experimental work.

The Minneapolis Junior Aero Club has been formed in Minneapolis, Minn., by seven boys for the purpose of gaining knowledge and experimenting with small models. Merrill W. Seymour is president, Stillman C. Chase, secretary and Maurice Conn, treasurer. Mr. Chase's address is 3047 Fifth Avenue South.

The **Aeronautic League of New Jersey** at its next four meetings will hold discussions on the subject of "Ignition for Gas Engines." Correspondence and catalogues from manufacturers of any appliances relating to the above subject is solicited.

The League is further contemplating an open air model contest to be held during May or June at its aviation field at the Guttenberg Race Track. All correspondence for the League is to be addressed to William A. Kraus, Aeronautic League of New Jersey, 116 Third Street, Union Hill, N. J.

THE MISSOURI SIGNAL CORPS IN AERONAUTICS

By Andrew Drew.

THE Signal Corps of the National Guard of Missouri, which was the first of the American militia organizations to take up aeronautics, has ambitious plans for the coming season. Two aviators, Thomas Benoist and H. F. Kearney, have been enrolled as members of the corps and have sent their machines to Kinloch Field, near St. Louis, where the Aero Club of St. Louis has allotted space for the work of the Signal Corps men. The two aviators will teach the other members of the Corps to fly and the plan is to have each of the thirty men the holders of aeroplane pilot licenses within the year.

Officials of the War Department have expressed themselves as favoring the equipment of militia corps which have become interested in aviation with aeroplanes. First Lieutenant John P. Hart, commanding officer of the Aero Wireless Company Signal Corps, N. G. M., says that correspondence with army officials has given him good reason to believe that the war department is already making plans along this line.

The members of the Signal Corps of Missouri expect to be the first to receive whatever the government gives in the way of aeronautic equipment. They base their expectations on the fact that the corps was the first in the field and also because of the aeronautic work members of the corps have already done. For this reason the history of the corps is interesting.

The idea of the Signal Corps of Missouri devoting itself to aeronautics was conceived as long ago as 1907 when the International Balloon Race was held from St. Louis. Col. Roosevelt, at that time President, had given instructions that the balloons should be sent away by the U. S. Army Signal Corps, assisted by a regiment of regulars from Jefferson Barracks.

Lieutenant Hart at that time was in charge of one of the squads and became enthusiastic over the idea that a military corps could do much more satisfactory work in balloon races than any civilian squad. The following year Adjutant General Rumbold of Missouri officially instructed the formation of an aeronautic squad in the Signal Corps.

This squad had charge of the field at the first aeroplane meet held in this country in St. Louis, October, 1909, and of the balloon race held the same month from the same city. The work of the Signal Corps men was so satisfactory that the Aero Club of St. Louis sent several of the corps on balloon trips and the pilots of the Club instructed the corps in the science of navigating the air.

During the following winter the Corps devoted itself to the study of aeronautic principles and also to preparation for handling the great 1910 International and the aeroplane exhibitions in St. Louis. It was during these exhibitions and at the race that the work

of the corps began attracting attention throughout the country.

Among other things the corps was drilled in what to do in case of an accident. On the third day of the exhibitions at Kinloch Field the unfortunate Johnstone, who was afterwards killed at Denver, slipped on a spiral and his machine struck the ground, and crumpled up like an envelope.

The Signal Corps men had been told that in the event an aviator is not killed by his fall he may be killed by fire or by the engine crushing him. So the members of the Corps raced across the field, half of them formed a line around the wreckage to keep away anyone with a cigarette or cigar, and the rest lifted the engine, which was sagging over the aviator, and pulled Johnstone out. The officials of the meet said that it was the best organized bit of rescue work they had ever witnessed.

It was during this meet that Col. Roosevelt made his historic ride with Hoxsey. Before the flight the Colonel, who, being a great military enthusiast, had become much interested in the work of the Signal Corps, said that he would go up as a representative of the Corps.

So after his landing Lieutenant Hart, in order to return the compliment, ascended with Walter Brookins and made the first military reconnoitre in America from an aeroplane. He ascended to a height of 3,000 feet, passed over the Missouri River, flew over the Florissant Valley, taking military sketches, which, on his return to the field, he presented to the delighted Rough Rider with military formality.

Other members of the Corns were also taken up by the Wright aviators to throw bombs at a mimic battleship and a telephone wire laid in rapid order a mile across the field by the Signal Corps men enabled the officials of the meet to get the correct time of the great speed test of Leblanc when he traveled at the rate of 67 miles an hour.

HOW TO BUILD A CURTISS-TYPE BIPLANE*

By G. H. Godley

(Continued from March number)

THE USE OF TUBING.

For working the tubing into shape a plumber's blow-torch is almost indispensable. Many automobilists will already possess one of these. The flat oval variety, holding one pint of gasoline, is convenient because it packs away easily, but on steady work needs to be refilled rather too frequently. With a dozen bricks a shield can be built in front of the torch to protect it from drafts and concentrate the heat.

Wherever it is to be flattened and bent the tubing should be brought to a bright red or yellow heat. Screwing the vise down on it will then flatten it quickly and without hammer-marks. Where the bend is to be in the middle of the piece it may be necessary to use hammer and anvil.

It is convenient to start with the frame-work under the rear beam. This may be drawn accurately, full size, on the workshop floor, and the tubes bent to fit the drawing. With this frame-work once in place one has a definite starting point for the rest of the running gear. Here, and in all other places when bolting through wood, the holes should be drilled out full, and large washers should be placed under bolt-head and nut. All nuts should have some sort of a locking device. The perspective drawing herewith should show the general arrangement clearly enough to enable the builder to finish the running gear. In the next article the outriggers and controls will be discussed.

Both the front and rear control members or "outriggers," as they are usually called, may conveniently be built up on the central section of the main frame, which, it is assumed, has been fitted with the running gear described. The horizontal rudder, or "elevator," is a biplane structure like the main frame of the machine, but with fewer struts; it is carried in front of the main planes on two A-shaped frames. The vertical rudder, at the rear, is split along the middle and straddles a fixed horizontal plane or "tail." This also is carried on two A-shaped frames. Lateral stability is controlled by two auxiliary planes or "ailerons," one at each side of the machine, and carried on the two outer front struts of each side. These three control units—elevator, tail and rudder, and ailerons—will now be taken up separately, and their construction, location on the machine, and operation will be described.

THE HORIZONTAL RUDDER OR ELEVATOR

The two planes of the elevator are each 2 feet wide by 5 feet 8 inches long, and are spaced 2 feet apart, being held in this position by ten struts. The frames of the planes are built of spruce sticks ½ by 1 inch, each plane having two sticks the full length and five evenly spaced cross-pieces or ribs. These are joined together with squares of "X" sheet tin, as shown in the detail sheet drawing. With a little experimenting, paper patterns can be made, from which the tin pieces can be cut out. The sticks are then nailed through the tin with ¾-inch brads.

It is convenient to draw the frames out accurately on a smooth wood floor, and then work over this drawing. The first few brads will hold the sticks in place. When all the brads have been driven in, a little drop of solder should be run in around the head of each one. This is a tedious job; one must be careful to use no more solder than necessary, as it increases the weight very rapidly. Two pounds of wire solder should be sufficient for all the control members which are built in this way. When the top side is soldered up, pry the frame loose from the floor with a screw-driver and turn it over. Then the projecting points of the brads must be knocked over and the soldering repeated.

At this stage the two frames should be covered on both sides with the prepared cloth used for covering the main planes. For the sake of brevity, the cloth will be discussed elsewhere in this article.

The struts, so called to continue the analogy with the main planes, are turned sticks of spruce ⅜-inch in diameter. They are fitted at each end with ferrules of thin brass or steel tubing driven on tightly. Instead of using sockets, the struts are held at each end simply by a long wood screw driven through the tin and wood of the plane frame and into the strut. These screws also hold the turnbuckles for the truss wires. For trussing purposes the elevator is regarded as consisting of two sections only, the intermediate struts being disregarded.

The turnbuckles and wire used here and in the other control members may well be of lighter stock than those used in the main planes. No. 18 piano wire or 1/16-inch cable is amply strong; the sheet steel may be about 22 gauge instead of 16, and the bicycle spokes smaller in proportion. No turnbuckle plates are necessary; the screws running into the struts may be passed directly through the eyes of the turnbuckles, where they would

*Begun in the February number.

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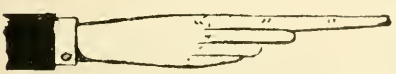

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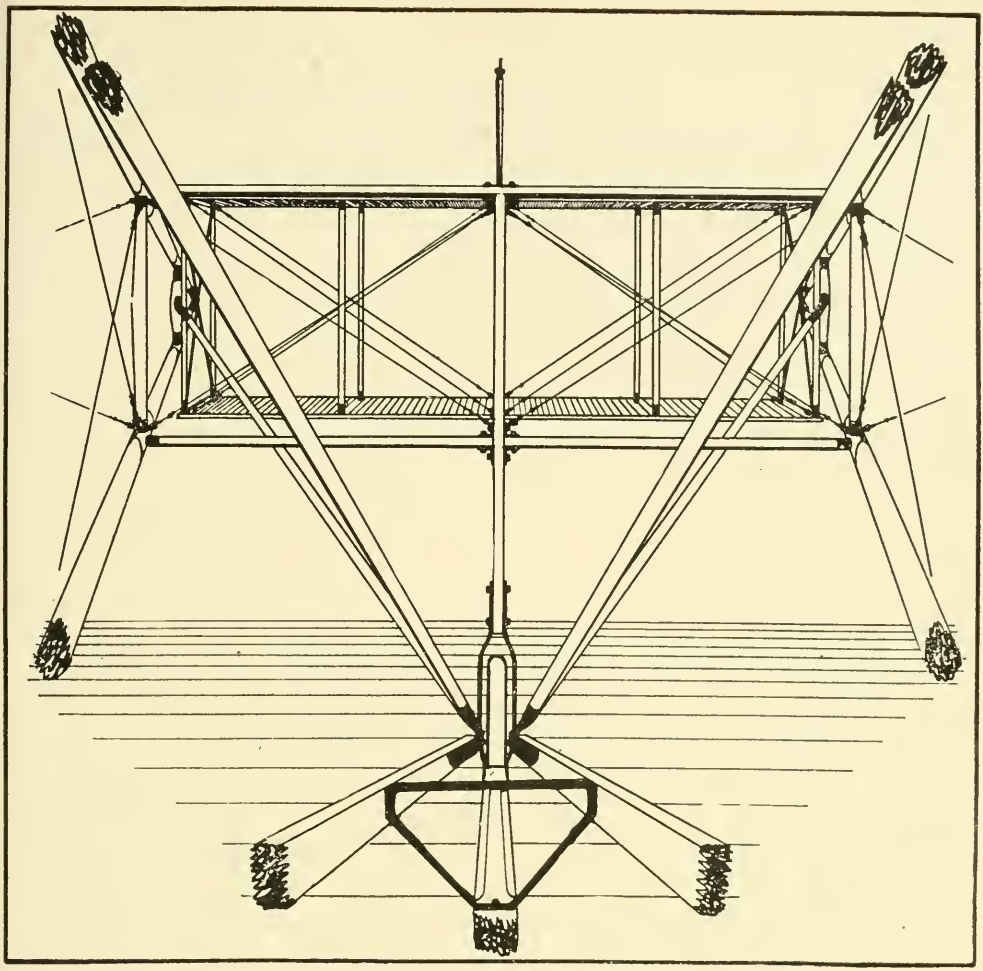


Front Outriggers and Elevator, as Seen from the Driver's Seat.

have been attached to the turnbuckle plate. In order to secure a square and neat structure, those struts which have turnbuckles at their ends should be made a trifle shorter than the others.

At each end the elevator has an X-shaped frame of ¼-inch steel tubing; at the intersection of X's are the pivots on which the elevator is supported. Each X is made of two tubes bent into a V and flattened and brazed together at the points. The ends of the X's are flattened and bent over so that the screws which hold the struts in place may pass through them.

To the front middle strut is attached an extension which acts as a lever for operating the elevator. This is a stick of spruce ¾-inch in diameter and 3 feet 3 inches long; at its upper end it has a ferrule of steel tubing, flattened at the end. The lower part of the stick may be fastened to the strut by wrapping the two with friction tape or by improvising a couple of sheet-steel clamps. The upper end of the stick is braced by a ¼-inch steel tube extending to the top of the rear middle strut, and held by the same screw as the strut.

This extension lever is connected to the steering column by a bamboo rod 1 inch in diameter and about 10 feet long, provided with flattened ferrules of steel tubing at each end. Each ferrule should be held on by a ⅛-inch stove bolt passing through it.

FRONT AND REAR OUTRIGGER FRAMES.

Both the front elevator and the tail and rudder at the rear are carried, as mentioned above, each on a pair of A-shaped frames, similar to each other except that those in the rear are longer than those in the front. Both are made of spruce of about the same section as used for the struts of the main frame. These pieces may either be full length, or they may be jointed at the intersection of the cross-pieces, the ends being clamped in a sheet-steel sleeve just like that used on the beams of the main frame. In this case it is advisable to run a ⅛-inch stove bolt through each of the ends.

The cross-pieces of the A-frames are spruce of the same section or a little smaller. At their ends may be used strut sockets like those of the main frame; or, if it is desired to save this expense, they may be fastened by strips of 1/16-inch steel stock with through bolts.

The front outrigger has, besides the two A-frames, a rather complicated arrangement of struts designed to brace the front wheel against the shocks of landing. This arrangement does not appear very plainly on a mechanical drawing, and may best be understood by reference to the photograph and the perspective drawing. This drawing is a view from the driver's seat; the elevator is seen in front the A-frames at each side, and at the bottom the two diagonal beams to the engine bed and the skid.

(To be continued)

U. S. PATENTS ABSTRACTED

Mertram George Cooper, Surbiton, England, 977,068, Nov. 29, 1910. Filed Jan. 30, 1909. PROPELLER FOR OPERATING ON FLUIDS. Propeller and mechanism reciprocating and turning movement changing the pitch to obtain a resistance or thrust at only one portion of a stroke.

Reuben R. Eubank, Jr., and Judson C. Eubank, of Kansas City, Mo., said Reuben R. Eubank, Jr., assignor to Mary E. Eubank, of Kansas City, Mo., 977,517, Dec. 6, 1910. Filed Oct. 15, 1908. FLYING MACHINE. Helicopter combination, parachutes, and propellers.

Victor G. Gustafson, Joliet, Ill., 977,523, Dec. 6, 1910. Filed July 28, 1909. AUTOMATIC BALANCING DEVICE. Liquid in vessel makes electrical contact when equilibrium is disturbed, operating controlling mechanism.

Augustus F. W. MacManus, San Antonio, Tex., 977,528, Dec. 6, 1910. Filed Oct. 19, 1909. "AEROPLANE." A system of ailerons between main surfaces actuated by a combination of bell-crank and swinging levers, and cables attached to a steering column and pulley, and which also operate the elevator; means for flexing ailerons and elevator.

Reinhold Schmiechen, Ledyard, Iowa, 977,555, Dec. 6, 1910. Filed Aug. 12, 1909. "OCEAN AIRSHIP." Gas envelope of semi-circular cross-section inclosing series of cells; hinged head; gas-filled aeroplane projecting from under side; vertically lighting propellers.

Reinhold Schmiechen, Ledyard, Iowa, 977,556, Dec. 6, 1910. Filed Sept. 13, 1909. "MEANS FOR MAINTAINING THE EQUILIBRIUM OF AIRSHIPS AND OTHER FLYING MACHINES." Equilibrium device for aeroplanes and dirigible baloons, utilizing the pendulum system for automatically adjusting stabilising mechanism.

Edward Berthelf, Watkins, N. Y., 977,997, Dec. 6, 1910. Filed July 6, 1909. "FLYING MACHINE." Helicopter with parachute attachment.

Horace G. Hill, Youngs, Miss., 978,375, Dec. 13, 1910. Filed Aug. 13, 1909. "FLYING MACHINE." Helicopter with vertical and horizontal propeller, mounted on a frame carrying a movable sustaining surface for determining direction of flight.

William Wallace Gibson, Victoria, B. C., Canada, assignor of one-half to David W. Hanbury, Victoria, B. C., Canada, 978,732,. Dec. 13, 1910. Filed March 11, 1910. "FLYING MACHINE." Tandem monoplane, wings set at dihedral angle, long diamond-shaped surfaces in the direction of flight.

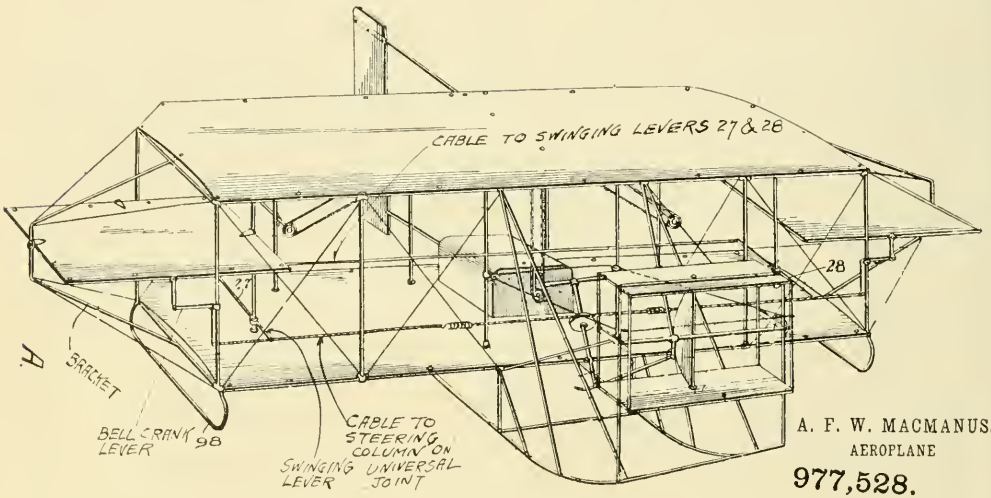
Roscoe C. Gore, Tecumseh, Neb., 979,286, Dec. 20, 1910. Filed Dec. 29, 1908. "AERIAL NAVIGATOR." A reciprocating movement is communicated to six vibrating wings.

Mortimer W. Sargeant, East Orange, N. J., 979,341, Dec. 20, 1910. Filed July 15, 1909. "FLYING MACHINE." Aeroplane, with part of center hollowed like a soup plate, with a propeller in a vertical plane at rear end of hollowed portion.

Fred Goehner, Buffalo, N. Y., 979,472, Dec. 27, 1910. Filed Sept. 27, 1909. "FLYING MACHINE." Rotating wings or propeller blades [like the paddlewheels of a boat] reefing or folding a portion of each revolution.

Johannes Massohn, Hamburg, Germany, 979,979, Dec. 27, 1910. Filed Feb. 1, 1910. "AIRSHIP OF THE RIGID TYPE." Dirigible balloon of the rigid type construction, with engine and propeller raised to approximately centre of figure.

Paul Daniel, Perth Amboy, N. J., assignor to Adams C. King, New York, N. Y., 980,073, Dec. 27, 1910. Filed April 12, 1910. "CON-



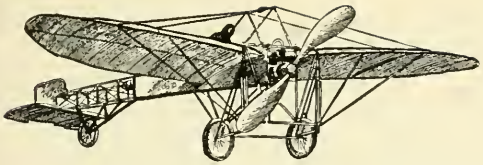
TROLLING MEANS FOR AEROPLANES." Aeroplane control by means of a single universal device. Claims cover vertical balancing planes above and below main planes, with means for operating them simultaneously in either the same or opposite directions; operating elevator and vertical rudder with same mechanism.

Carl Huber, Berlin, Germany, 980,267, Jan. 3, 1911. Filed Sept. 13, 1909. "FRAMEWORK STRUCTURE FOR BALLOONS." Framework consisting of a series of longitudinal girders, the whole built of corrugated or triangular sections to make a rigid structure.

Henry J. Casanova, Chicago, Ill., 980,489, Jan. 3, 1911. Filed Oct. 9, 1909. "FLYING MACHINE." Ornithopter with vibrating wings, furnished with valves or shutters, opening on the up stroke, propellers front and rear.

James M. Chritton, Rocky Ford, Col., 980,599, Jan. 3, 1911. Filed Jan. 28, 1910. "AERODROME." Vibrating or flapping wing machine, designed to propel and both up and down stroke, tilting fore and aft to maintain equilibruim; combined with rear propeller.

William J. D. Bradford, Killeen, Tex., 980,753, Jan. 3, 1911. Filed Aug. 7, 1909. "AIRSHIP." A number of cylindrical containers with means for maintaining equal pressure in



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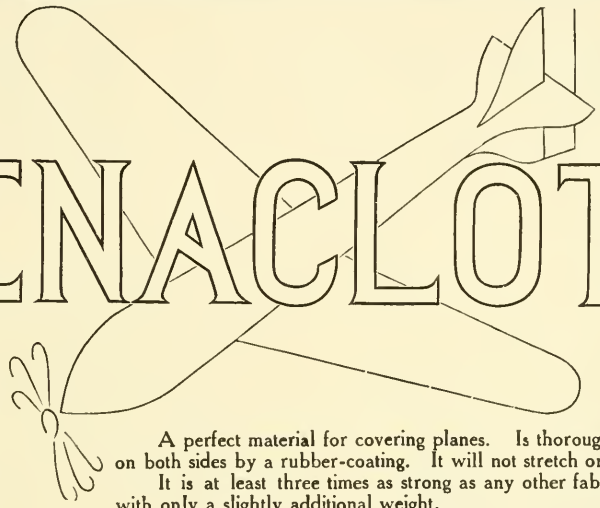

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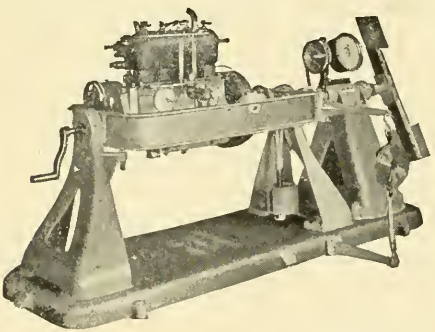

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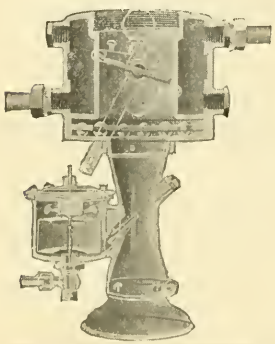

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all, to be driven with propellers on the forward end.

Matthew Rozboril and Peter Bursky, Binghamton, N. Y., 980,840, Jan. 3, 1911. Filed April 9, 1909. "AIRSHIP." Utilizes a gas envelope and flapping wings for sustaining weight and a propeller for driving. Exhaust gases fed into gas envelopes.

Thomas Fahey, Spokane, Wash., 980,935, Jan. 10, 1911. Filed June 29, 1910. "AERIAL PROPELLER." Provides a specially constructed propeller, capable of adjustment at any point from the horizontal to the perpendicular, or to a position anywhere within 90 degrees of a circle.

John W. Currell, Youngstown, Ohio, 981,068, Jan. 10, 1911. Filed Dec. 2, 1908. "DIRIGIBLE AERIAL TORPEDO." Designed to be discharged from air craft, with means for steering the torpedo.

G. M. Fowler, San Francisco, Cal., 981,185, Jan. 10, 1911. Filed Nov. 3, 1909. "AERIAL APPARATUS." Closed body shown as cigar-shaped, two propellers at bow end, planes running lengthwise the body, but curved transversely and having flexible tips and automatic means for flexing, etc. Twenty-four claims in all.

Frederick Brackett, Washington, D. C., 981,367, Jan. 10, 1911. Filed Nov. 17, 1909. "AIR CRAFT." Gasless machine having the supporting surfaces composed of a plurality of hollow cones, point forward, with means for changing their position by turning on a pivotal bar.

Joseph A. Goodwin, Berkley, Va., 981,410, Jan. 10, 1911. Filed March 25, 1910. "AEROPLANE." Covers an "improved arrangement of wings, framework and automatic balance." Flexible wing sections automatically controlled to maintain equilibrium.

F. Milligan, 981,714, Jan. 17, 1911. Filed Dec. 24, 1909. "AEROPLANE FLYING MACHINE." Folding wings for an aeroplane.

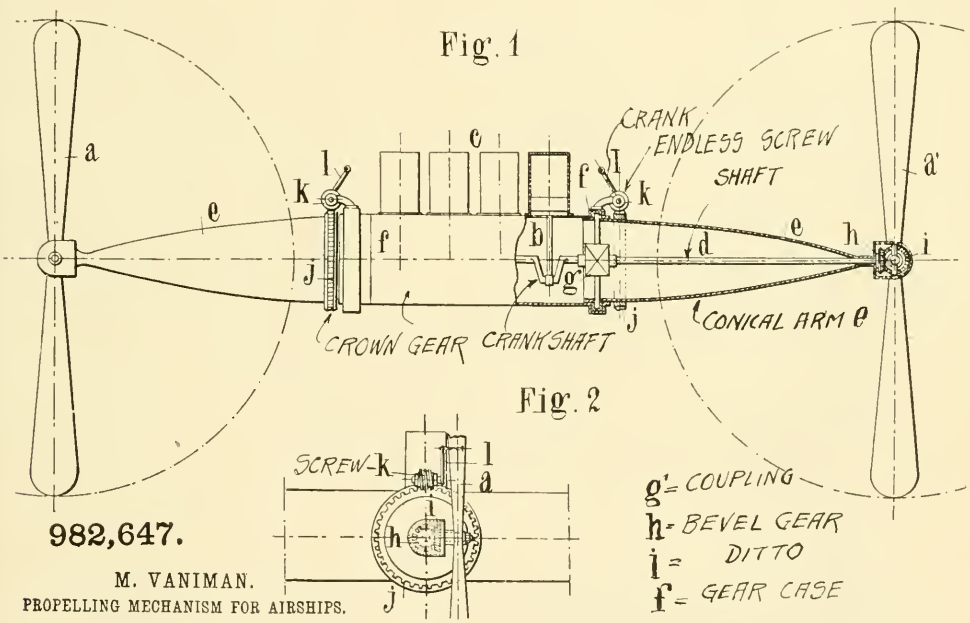
Edwin Lyman Madden, Ingersoll, Okla., 981,788, Jan. 17, 1911. Filed Feb. 13, 1909. "AIRSHIP." Windmill wheels in a horizontal plane; also in vertical plane for forward direction; all arranged about a vertical mast, which latter is fitted with a parachute.

Robert A. Moore, Chicago, Ill., 982,290, Jan. 24, 1911. Filed Jan. 5, 1910. "FLYING MACHINE." Monoplane with wings made of detachably connected triangular sections covered on both sides with fabric. Wings contain air-tight compartments for holding of buoyant gas. The upper side of each wing is laterally convex, for the most part, turning up at the extremities.

Louis Valentin Feuillet, Paris, France, 982,356, Jan. 24, 1911. Filed Oct. 18, 1909. "DIRIGIBLE BALLOON." Cigar-shaped envelope with triangular cross-section keel, parachute fitted over central portion, enclosed car with searchlight, cannon, rudders at rear of keel, as well as car, propellers at rear of car on concentric shaft.

C. L. Anway, Parsons, Kan., 982,561, Jan. 24, 1911. Filed Oct. 27, 1909. "AIRSHIP." Cigar-shaped, compartments for gas, hollow core through longitudinal center with propellers located in this air passage. Compartments in middle of the envelope or body for passengers and engines. Horizontal and vertical rudders and small planes on sides.

Melvin Vaniman, Gennevilliers, France, 982,647, Jan. 24, 1911. Filed May 3, 1909. "PROPELLING MECHANISM FOR AIRSHIPS." The single claim reads: "Mechanism for causing the elevation and depression of propelling screws for dirigible balloons and aeroplanes,



James M. Keller, Detroit, Mich., assignor to Keller Monoplane Airship Co., of Dallas, Tex., 981,655, Jan. 17, 1911. Filed Nov. 13, 1905. "AIRSHIP." Dirigible balloon with a parachute, which, normally, completely covers the upper half of the gas bag and extends horizontally all the way around at the meridian by means of a frame. A cord releases the retaining device and allows the parachute to fill out above the gas bag.

Walter A. Suman and George W. Reichard, Portland, Ind., assigners of one-third to Wm. said mechanism comprising a tubular crank case having open ends, tubular members rotatably mounted on the ends of the crank case and aligned therewith, a crank shaft extending longitudinally through the crank case and tubular members, a plurality of engine cylinders supported directly on the crank case, pistons operating them, pitmen connecting the pistons and cranks of the crank shaft, and propellers mounted on the ends of the tubular members and geared directly to the ends of the crank shaft."

The device is mounted on the car at right angles to the median plane of the balloon. A rotary movement is given the arms "ee," which changes the plane of rotation of the propellers. Either arm may be operated independently or simultaneously in the same or opposite directions for the guiding of the airship in horizontal or vertical planes.

William S. Matthews, Big Stone Gap, Va., 982,653, Jan. 24, 1911. Filed Sept. 2, 1910. "TOY FLYING MACHINE."

Elisha D. Appley, Liberty, N. Y., 982,700, Jan. 24, 1911. Filed June 7, 1909. "FLYING MACHINE."

A. C. Ulmer, Pascagoula, Miss., 982,907, Jan. 31, 1911. Filed Sept. 14, 1910. "LIFE PRESERVER FOR AVIATORS." Parachute contained in a cap or other head covering, with belt and shoulder straps around body of aviator.

Jerome Knowles, Newport News, Va., 983,147, Jan. 31, 1911. Filed Aug. 10, 1910. "AERIAL TOY."

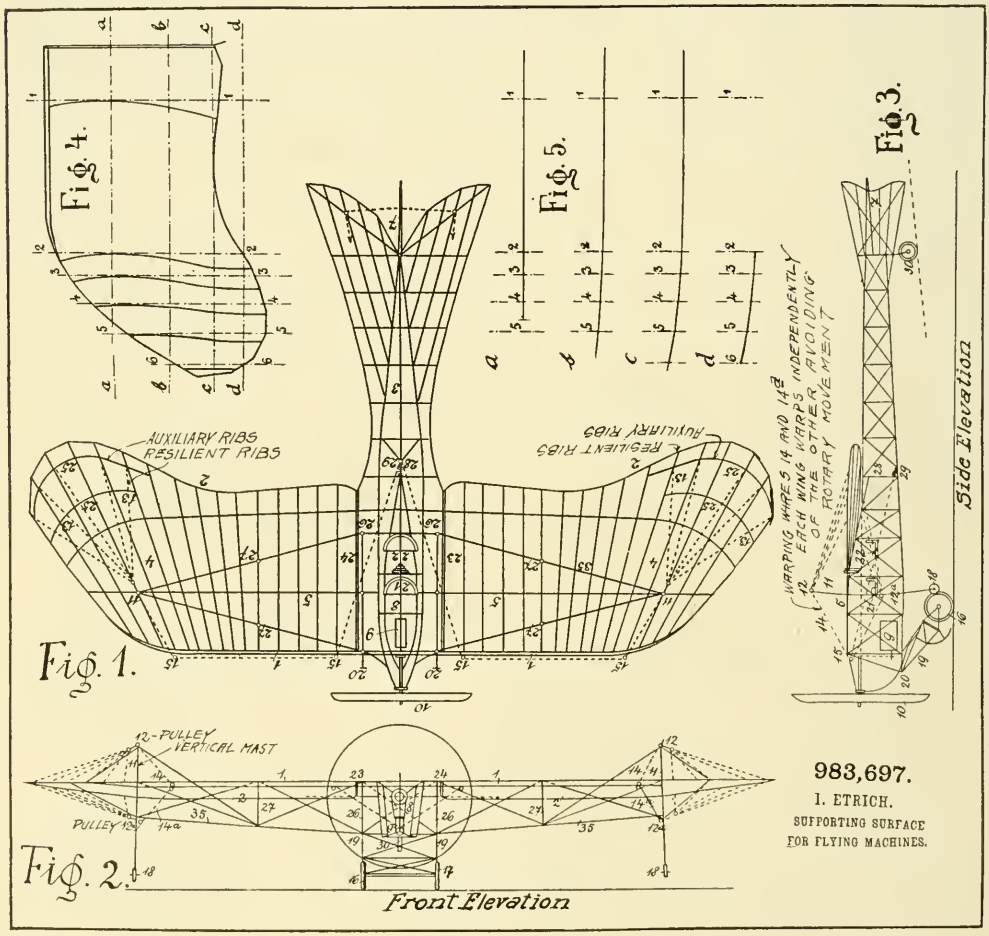
Samuel S. Yarrington, Wilmington, Del., 983,192, Jan. 31, 1911. Filed Jan. 14, 1910. "AERIOPLANE." Combined aeroplane and helicopter.

983,243, Jan. 31, 1911. Filed March 23, 1910. "AIRSHIP." Combination monoplane and biplane, one main wing surface and two superposed wing surfaces. Planes and rudders arrow-shaped.

Cassius E. Lamburth, San Francisco, Cal., 983,244, Jan. 31, 1911. Filed June 21, 1910. "AIRSHIP." Both of these too complicated to describe.

Robert G. Rettinger, Sunbury, Pa. assignor of one-half to William H. Greenough, 983,459, Feb. 7, 1911. Filed Feb. 7, 1910. "AIRSHIP." Combination of dirigible balloon and planes. Semi-circular plane on frame surrounding upper half of envelope.

Igo Etrich, Vienna, Austria-Hungary, 983,697, Feb. 7, 1911. Filed Aug. 12, 1910. "SUPPORTING SURFACE FOR FLYING MACHINES." In simple language, the patent is intended to cover the flattening of the curvature toward the lateral extremities of the wings, possibly flying with a slight negative pressure at the extremities, accompanied by a backward sweep, helping to maintain a straight course, accompanied by the familiar wing warping. The Etrich aeroplane has made many flights in Austria.



James Humphris, Johannesburg, Transvaal, 983,233, Jan. 31, 1911. Filed Aug. 26, 1910. "AERIAL MACHINE." Propeller mounted on vertical shaft in combination with beating wings.

Cassius E. Lamburth, San Francisco, Cal.,

The central portion is, as usual, uniformly curved, which merges gradually into the rear approximately plane part of the end portions.

Fig. 4 shows one-half the supporting surface with the sections on the lines I, I; II, II; III, III; etc. Fig. 5 shows the sections on

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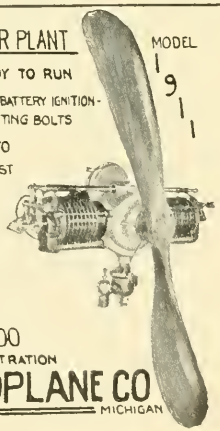

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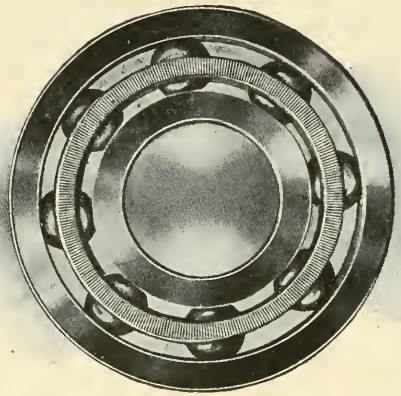

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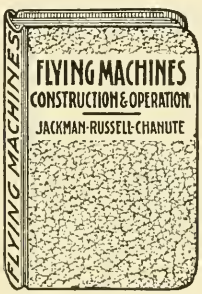

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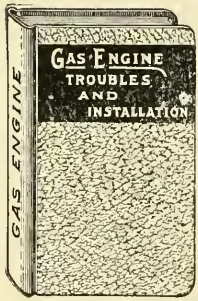

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the lines a, a; b, b; c, c and d, d, of Fig. 4.

Claim 1 reads:

"In a supporting surface for flying machines the combination of a central portion, the sections of which in planes parallel to the vertical plane of symmetry are concave downward throughout, the front edge of such central portion being at a higher level than its rear edge but at a lower level than the ridge line while the sections of such central portion in vertical planes perpendicular to the said plane of symmetry are substantially straight lines, and of end portions the sections of which in planes parallel to the vertical plane of symmetry of the supporting frame are substantially straight and horizontal in the extreme ends of the said end portions in substantially the level of the ridge line, while such sections nearer to the said central portion are concave downward in their front part and gradually merge into substantially straight and horizontal lines to the rear, the sections of the said end portions in vertical planes perpendicular to the vertical plane of symmetry of the supporting surface being convex downward rising from the central portion outward, substantially as and for the purpose described."

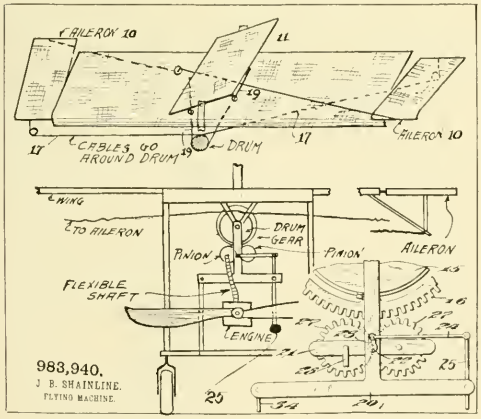
John W. L. Harrell and John Dailey, Argos, Ind., 983,707, Feb. 7, 1911. Filed July 30, 1909. "AEROPLANE." Combination of aeroplane and helicopter.

Frederic Mylius, Atlanta, Ga., 983,750, Feb. 7, 1911. Filed Sept. 28, 1910. "AIRSHIP." Monoplane whose plane is concavo-convex in cross-sections, with inwardly extending flanges which overlap and make possible adjustment of curvature.

John E. Kaupke, New York, 983,826, Feb. 7, 1911. Filed Aug. 27, 1910. "FLYING MACHINE."

William R. Bellville, Wyandotte, Mich., and Lloyd L. Bellville, Detroit, Mich., 983,868, Feb. 14, 1911. Filed Sept. 30, 1910. "AEROPLANE." Biplane wedge-shaped plan view, two propellers at rear, horizontal rudders in front.

Joseph B. Shainline, Norristown, Pa., 983,940, Feb. 14, 1911. Filed March 28, 1910. "FLYING MACHINE." Patent relates to the provision of automatic stability by ailerons, operated by wires over a drum; the drum being fitted with a gear which intermeshes with continuously turning pinions, either when a pendulum brings one or the other of the pinions into contact with the gear, or caused



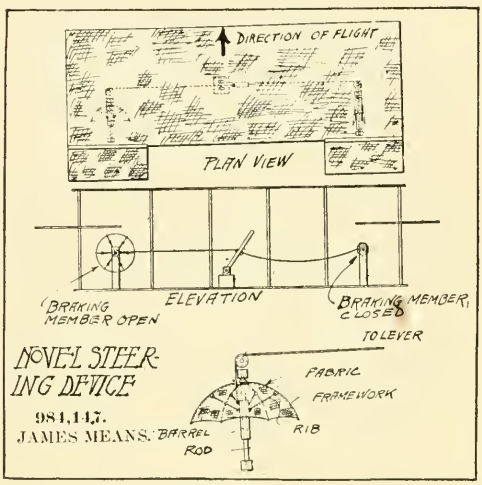
manually. The pinions are constantly in motion through a flexible shaft driven from the motor.

The operation is as follows: When the machine tilts to one side, the movement of pendulum 25 at an angle to its normal position, through the medium of link 24, crank arm 23, shaft 22, and frame 21, moves one of the pinions 27 into mesh with gear 16, to turn drum 15, as the pinions 27 are being continuously turned by shaft 28, the pinion 27, gear 16 and drum 15, will move wires 17 and 19, to change the angles of planes 10 and 11, and compel the machine to automatically right itself. The direction of movement of the planes depends on which pinion 27 is moved into mesh with gear 16, and this is controlled automatically by pendulum 25.

Joseph E. Cooper, Cripple Creek, Col., 984,076, Feb. 14, 1911. Filed April 7, 1910. "MILITARY AIRSHIP." Dirigible balloon with gas compartments in envelope, propellers inside open-ended tubes mounted on each side of cabin at rear of gas vessel; propellers on each side to rotate in opposite directions.

James Means, Boston, Mass., 984,147, Feb. 14, 1911. Filed April 6, 1910. "AERIAL NAVIGATION." System for turning in a substantially horizontal plane a machine to port or starboard in a "more positive and more effective" manner than by the usual vertical rudder. The drawing shows one method which might be used. Any shape of braking device or control thereof might be used.

The one claim reads as follows:



"In a flying machine, a pair of normally inoperative brakes or speed-retarding devices arranged symmetrically with respect to the longitudinal axis of the machine, said devices each comprising a stationary rod, a barrel surrounding said rod and movable thereon, a fabric-covered framework, and ribs connecting said framework to said barrel; a lever under the control of the operator, and cords connecting said barrels respectively with said lever, whereby the operator may bring either member of said pair into operative or braking position."

John Anderson, West Mount Vernon, Me., 984,255, Feb. 14, 1911. Filed Dec. 31, 1909. "FLYING MACHINE." Aeroplane in general aspect of a bird. Claims cover ribs of wings, extending laterally from the body, horizontal rudder capable of being flexed, a longitudinal beam connecting the ribs and braces and means for tilting the wings in unison for the purpose of steering right and left.

Adelard J. Beauregard, Woonsocket, R. I., 984,258, Feb. 14, 1911. Filed Sept. 30, 1910. "FLYING MACHINE." Combination of beating wings with valves therein, horizontal and vertical propellers.

Albert H. Friedel, Baltimore, Md., 984,269, Feb. 14, 1911. Filed Oct. 13, 1908. "FLYING MACHINE." Claims cover the use of multiple screws in a horizontal plane driven by compressed air through tubes. Gravity controlled valves for automatic control of power transmitted to each individual screw, etc. Helicopter type.

IN THE AERIAL MARKET PLACE

Test of the Roberts Aeronautical Motor.

The first of the new Roberts aeronautical motors was given a test at the factory in Sandusky, Ohio, on March 7. Flying conditions were similated as much as possible by mounting the motor on a special testing stand with a rolling frame carrying the motor. A spring was employed to get the thrust and a standard tachometer, carefully calibrated, gave the speed in r.p.m. An automobile radiator with 102 sq. ft. of cooling surface was placed in the path of the air current from the propeller, and the gasoline tank was placed at one side to be out of the way of the air stream.

After three short preliminary runs of about 20 minutes each, the motor was started on an endurance test. Some warming of the bearing nearest the propeller showed during the first test run, but this soon disappeared, and during the endurance test of 5 hours' duration neither the bearings of the cylinders warmed perceptibly. The radiator at no time was so warm that the bare hand could not be held against it without discomfort. The run was stopped because it was necessary to ship the motor without further delay to the Brooks Aeroplane Co., of Saginaw, Mich. So far as the performance of the motor was concerned and its condition after the test, it showed that the run could have been continued for many times 5 hours.

The motor starts very easily and shows no tendency to kick back, because the spark advance is secured by sliding a spiral drive gear instead of rocking the circuit breaker. In this way the maximum density of the spark is secured at any advance. The mechanism for sliding the magneto drive gear consists of a nut and worm, which is irreversible, and a light touch of the finger suffices to advance the magneto.

The crankshaft is very large, 2½ in. in diameter, and the bearings very long. The bearing nearest the propeller is 6⅜ in. long. The entire length of the shaft is 40 in. The weight of the shaft with the stop plugs is 18¼ lbs. The weight of the finished forging is 17½ lbs. It is interesting to note that the weight of the rough-turned forging for this shaft is over 80 lbs.

The Roberts Motor Company has produced a new light alloy suitable for cylinders, which is claimed to give results fully equal to cast iron and weighs no more than aluminum, although very dense and strong. The cylinders are waterjacketed all about the exhaust ports and quite a distance below these ports. This prevents cylinder distortion and overheating. Backfiring is overcome by the "cellular bypass" used on the Roberts marine motors for the past three years.

The distributing valve on the side of the crankcase is one secret of the great power of the motor, and explains the great power of the motor, which showed 312 lbs. thrust at 700 r.p.m. and 400 lbs. at 900 r.p.m. on a Paragon propeller 8 ft. diameter by 5 ft. pitch.

It is a tribute to the excellence of the design and workmanship to find that the motor was rushed through the factory, put at once on the endurance run and accepted by an exacting customer without a single alteration being made in any part.

The aeronautical engineer of the Brooks Aeroplane Co., E. R. Armstrong, is well known in St. Louis aviation circles and was engaged by this concern to design aeroplanes on the well-known Brooks 'knock-down" principle. Mr. Armstrong was given carte blanc in the selection of a motor and finally chose the Roberts.

The Walters engine, which was built in Denver by Guy C. Walters, has been purchased by E. Linn Mathewson for his next machine (No. 3). It is an air-cooled 40-h.p., 160-lb. motor, which is said to really cool. Full details will be given later.

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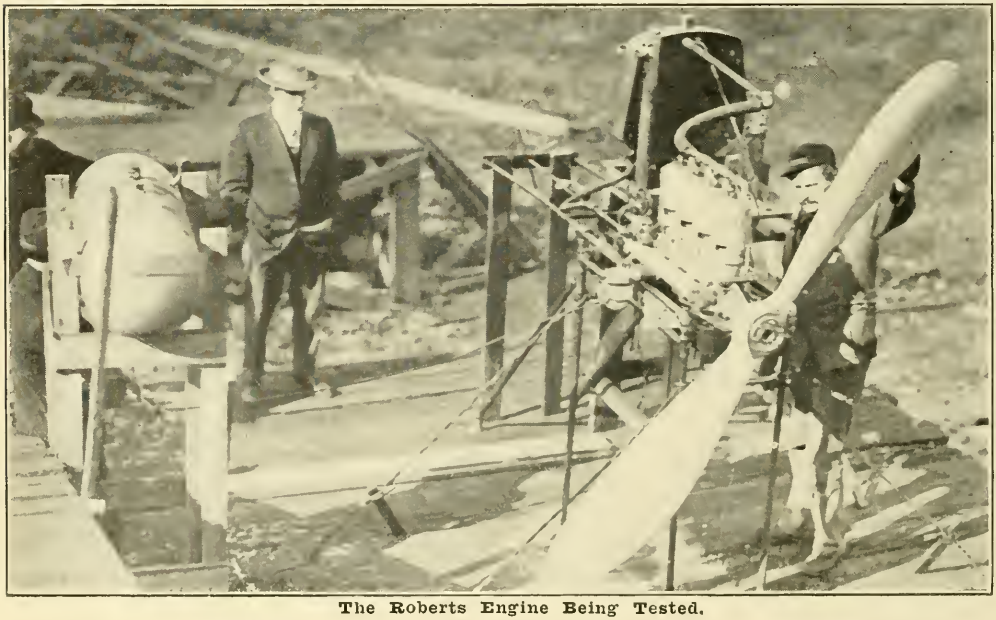
The dirigible of Isabura Yamada, whose experiments with airships has extended over a number of years, during all of which time he has been a subscriber to AERONAUTICS, recently made a trip over Tokio with a crew of five men. In landing, however, it met with a



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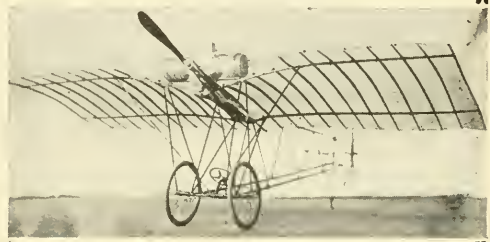

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Oval seamless steel tubing, 25c. per foot.

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Curtiss machines: Curtiss Aviators as instructors.
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Take a short vacation at the Nation's Capital where flying weather is exceptionally good.

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Sole agents for the Curtiss biplane in the District of COLUMBIA, vicinity and VIRGINIA.

Located at the Nation's Capital with aviation grounds adjacent to the aerodrome of the U. S. Army, the National Aviation School offers exceptional opportunities to those wishing to learn to operate a machine. Records show the Curtiss biplane to be the safest of all air craft.

Makes Flying Easy As Lying

It Can Be Proved From thousands of standard technical books her engines are vastly superior to anything —that ever drove a piston.—

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her MAGNIFICIENT SUPERSTRUCTURE, in harmony with natural laws, literally WHIZZES through the atmosphere like a meteor, annihilating both time and distance.

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Buy a pair of propellers for your aeroplane model direct from the manufacturer at the lowest cost.

We are making for models a type of wooden propellers plain and laminated from four inches up to four feet in size.

Our propellers represent the latest accomplishment and are made by skilled mechanics.

We are selling propellers at extremely reasonable prices and will allow a special discount on large orders.

We are the manufacturers of a Standard type, full sized "M.A.P. Monoplanes" with a perfect automatic stability and a most powerful and speedy machine.

Our "M. A. P. Monoplanes" are patented in the U. S. A. and Great Britain.

Write to-day for price list.

Invented, designed and built by the

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(To order) Complete set Curtiss-Willard type ribs, uprights and main beams, only **$75.** Small set Curtiss Ribs, uprights and main beams, **$50.**

Standard Turnbuckles, $.10 each. Sample Rib, $1.00

Address: STRATFORD, CONN.

BLUE PRINTS AND WORKING DRAWINGS $1.00 Each

We furnish you full size working drawings of the Curtiss, Farman and Bleriot aeroplanes. Also, blue prints of model Wright, Curtiss, Bleriot and Antoinette aeroplanes at the same price. Address department R

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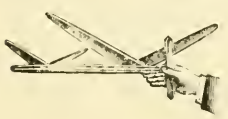

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¾-oz. to 1¼ lbs. Latter has flown 600 ft. 37 cts. to $5.28, postpaid.

RACING MODEL D, 1-oz., RECORD OVER 900 FT., $1.08 POSTPAID.

Send for Big Catalogue Models and Supplies

T. W. K. CLARKE & CO., High St., Kingston-on-Thames, England

mishap. It is of interest to note that the engine is an American one, made by the Detroit Aeronautic Construction Co. This is an example of the widespread circulation of AERONAUTICS and proof that the magazine is not alone a journal for the builder, but for the purchaser as well.

The French-American Balloon Co., 4460 Chouteau Ave., St. Louis, Mo., has gotten out a new catalogue of balloons and airships. Balloons cost from $625 for one man to $1,600 for an 80,000-cubic-foot balloon to hold seven people. Hydrogen gas plants are also listed.

"World Progress" is the name of a new magazine which has just made its appearance, published by E. F. Ingraham, 116 Nassau St., New York. Illustrated news items of interest, including aviation, from all over the world are given with short and concise text. Good luck!

Hugo C. Gibson is about to distribute a new booklet on propellers, entitled "The Little Red Book on Propellers," which contains various valuable and interesting information on propellers, and, of course, particularly with regard to Gibson "wheels." Gibson propellers are standard equipment now, with El Arco radiators, on Elbridge engines.

Geo. Wallace, of 103 Royal St., New Orleans, La., has gotten out some postcards, in four colors, of the most sensational flight at New Orleans of the late John B. Moisant, with a picture of Moisant inserted in the corner.

CLASSIFIED ADVERTISING

15c. a line. 7 words to a line. Payable in advance.

WILL any company take up my headless cylinder engine on following terms: 50 per cent. of earnings; also my automatic gustproof monoplane. If you mean business, write John MacDonald, Jr., Point Prim, P. E. Island, Que.

FOR SALE—A Curtiss 8-cylinder air-cooled engine, A1 condition. Price low. Would exchange for 4-cylinder, good make, smaller size. Christopher J. Lake, Bridgeport, Conn.

PROPELLERS—Guaranteed, 6 to 8 ft. diameter and pitch, laminated, 200 to 500 lbs. thrust. Introduction price $16.50. Payne & Neighbors, 604 South Ohio St., Sedalia, Mo.

BACK AND CURRENT NUMBERS of any magazine supplied at moderate rates. Magazines bought. Clippings furnished. A. W. Castellanos, 263 Armstrong Ave., Jersey City, N. J.

FOR SALE—Aeronautical motor 4½ by 4½, develops 15 h.p., weight 100 lbs., 2-cylinder, horizontal type, all bearings new and engine in first-class shape. Engine and carburettor $80. With new 6-ft. laminated true screw propeller, 4½ pitch, spruce $100. Address L. L. Bishop, 13 Florence Court S. E., Minneapolis, Minn.

EQUILIBRIST, SLACK WIRE WALKER, well educated, good business training in office, experienced in shop work, four seasons operating own automobiles, wishes to associate with manufacturer to give flying exhibitions, train others and prosecute business generally. Excellent reputation. Address "Equilibrist," care

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FOR SALE—50-horsepower "HF," or Harriman, aviation engine, new $700. This is the same size engine that the Harriman Motor Works are charging $1,675 for. Address Box 3, Girard, Kan.

LEARN AT HOME, in a few evenings, how to construct, operate and repair Flying Machines, Commercial Trucks, Automobiles, Motorcycles, Motor Boats, Gasoline Engines, Electric Motors. Big demand, with good pay for competent men. Thousands of positions open. Let us help you in place and pay. A postal card will do. Address EXTENSION DEPARTMENT, The Charles C. Thompson Co., 549 Wabash Avenue, Chicago.

SITUATION WANTED—Active and clean-cut young man, ex-observer of U. S. Weather Bureau and Meteorological expert, desires affiliations with aeroplane manufacturing company, with object of being instructed in practical flying, for which tuition will be paid. Proficiency acquired, position of demonstrator and salesman for company would be expected. A-1 references given and required. Address, Harry T. Johnson, 1213 Emerald Ave., Chicago Heights, Ill.

AVIATION MEETS—An expert in arranging and managing aviation meets, having the widest experience and best connections, is in a position to promote and conduct aeroplane contests for aero clubs and others. Address Aviation Manager, care AERONAUTICS.

A BEAUTIFUL, four-colored postcard of the late John B. Moisant flying at New Orleans, December 27, 1910. 2 for 5c; 25c per doz. Geo. Wallace, 103 Royal St., New Orleans, La.

WANTED—To fly aeroplane on percentage basis. Would prefer party putting up money to act as business manager. Am mechanic and understand gasoline engines. Big money in making small cities on guarantee. No proposition considered unless it is a proven plane. G. A. Bellinger, 62½ Richard St., Salt Lake City, Utah.

WANTED—A man who can help develop a new featured glider—"New Invention." For particulars apply A. L. S., care of AERONAUTICS.

AERO CALENDAR FOR U. S.

March 18-25—Pittsburg (Pa.) aero show and flights.
March 18-26—Havana (Cuba), Moisant aviators.
March 28-30—Daytona (Fla.), McCurdy.
March —.. —San Jose and Oakland (Cal.), Curtiss aviators.
April 2—St. Augustine, McCurdy and Ward.
April 6-12—Salt Lake City (Utah), flights.
June 28—Gordon Bennett aviation race, England.
October 9—Gordon Bennett balloon race, place not fixed.
April 10—Knoxville, Tenn., Curtiss aviators.

The famous "June Bug," the first aeroplane to make an officially observed flight in this country, has been presented to the Smithsonian Institution at Washington.

The "June Bug" is the third flying machine built by the Aerial Experiment Association, which was composed of Dr. Alexander Graham Bell, Glenn H. Curtiss, F. W. Baldwin, J. A. D. McCurdy and the late Lieut. T. S. Selfridge. It was an improvement on the "Red Wing" and the "White Wing," the first machines built by the association.

Earle L. Ovington, formerly president Federation American Motorcyclists, and who handled the FN motorcycle in New York, is now a full-fledged Bleriot driver. He is bringing to America a racing Bleriot, after receiving pilot license at the Pau school on the eighth lesson.

Patrick Y. Alexander, of the entire world, sincere patron of the science of aeronautics, has offered another $5,000 motor prize. The engine must average 40 b.h.p. throughout two 12-hour tests.

MODEL AEROPLANE SUPPLIES

¶ Engines, ¼ H.P., Weight, 4½ lbs.—1 H. P. 6½ lbs. Very strong, powerful and efficient. Complete line of accessories, ball-bearing propeller shafts. Miniature pneumatic tire wheels, made in six sizes. Turnbuckles, metal fittings, propellers, rattan, bamboo, all six sizes of selected woods, finest grade English Rubber strand, etc.

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WIRE

Aviator wire of high strength—Plated finish—Easy to solder—Aviator cord of twisted wire.

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Special grades of bamboo for aeronautic work. Reed, Rattan and Split Bamboo for models. All Grades In Stock.

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All Sizes built to order on extremely short notice. ¶ We do experimental work of all kinds. ¶ We are specialists in light, tubular, frame construction work :: :: :: :: :: ::

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PEDERSEN LUBRICATORS

¶ The P pump is the smallest practical rotary pump and can be regulated. Write for circulars.

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Lantern Slides and Enlargements our Specialty

Write for Catalogue — Agents Throughout Europe

What Our Aeroplane Builders Need

(Continued from page 119)

will but wait. Would it not be a material help to the substantial growth of the aeroplane industry if those who offer the money prizes for daring flights would instead offer prizes to engine builders for engines of extreme power, strength, lightness and reliability?

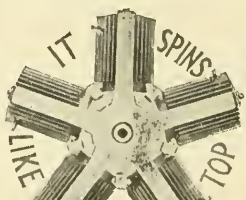
The only competitive aero engine test on record was held in England, and of the entrants, only one engine was able to run twenty-four hours without a stop. The data gathered in this test was extremely valuable, both to the purchasing public and to the manufacturers of the motor. England has purchased practically all the reliable data on aero engine tests for the past year. Properly conducted competitive motor tests would be very valuable to the aeroplane builder of America. He is only limited by his motor and reliability. Power and fuel consumption must be known to insure a successful machine. Nearly every builder has to experiment at his own expense, often wrecking several aeroplanes in order to determine facts about the motor which should be furnished him by any honest manufacturer. Some aero engine builders are themselves poorly equipped with testing apparatus.

Let us offer the prizes for endurance, altitude, distance and speed flights, as a stimulus to the manufacturer, and not the operator. Let the builder operate if he likes or let him hire an aviator, but a distinctive benefit would result if the prize could reach those worthy of it; those whose efforts are the most expensive and the most intelligent. We see then the aeroplane dependent on the motor and the motor dependent on the manufacturer whose object is profit. There is no authority for gas engine rating and there is no goal save gain for which to strive. Many examples of the present aeroplane are inferior in engineering and workmanship to products of analagous industries, and prizes are being won by daring individuals who are able to amass fortunes and retire from the field never to yield in return one thing that is of lasting value. Let us, by our demands as purchasers and by our prize offers as philanthropists, endeavor to create a higher standard for aeroplanes in America than in any country in the world.

Since last fall Peru has been aiding certain young Peruvians to carry to completion studies and work they had already undertaken and a special department has been instituted in the School of Arts and Crafts at Lima. The Chavez monument fund started in Lima has reached more than $35,000.

ADAMS-FARWELL

THE WORLD'S LIGHTEST AND SIMPLEST



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Less than 3 lbs. per H. P. A. L. A. M. rating

Self cooled by its own revolution

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Leading
BALLOON AND AIRSHIP CONSTRUCTOR
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VULCANIZED RUBBER MATERIAL
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Rubber Fabrics for Balloons, Aeroplanes and Airships

Passenger Aeroplanes and Flying Models

One to Fifty Passengers

Contractor to the United States Government
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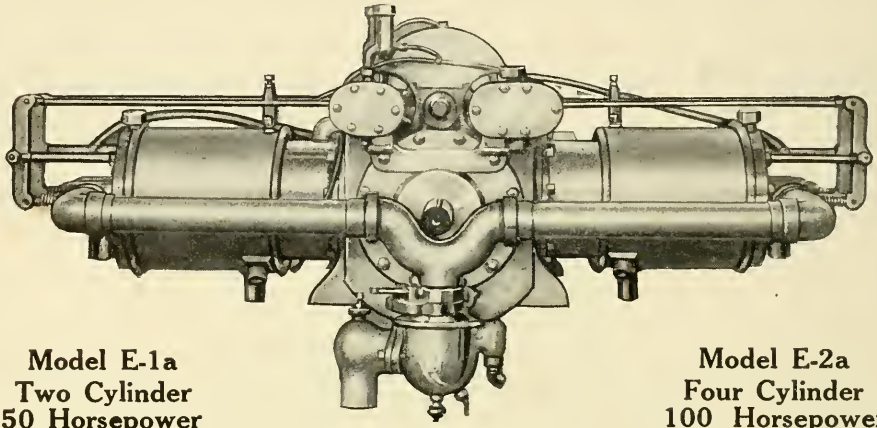
The CALL AVIATION ENGINE



Model E-1a
Two Cylinder
50 Horsepower
Weight 175 lbs.
Price $1,000

Prices include complete equipment

Model E-2a
Four Cylinder
100 Horsepower
Weight 325 lbs.
Price $2,000

TACOMAN FLIES IN OWN AIRSHIP.

(From Tacoma "Sunday Ledger," January 22, 1911.)

"Nerved by 11 years' experience as a professional balloonist and parachute jumper, Harvey Crawford, 22 years of age, thrilled between 300 and 400 spectators at Lakeview yesterday morning with three successful flights in the first "Made in Washington." also "Made in Tacoma." aeroplane that has thus far been able to get off and stay off the ground.

Traveling at a speed he estimated at between 40 and 50 miles an hour, young Crawford flew a mile and a half at an elevation of 100 feet on the first attempt; two miles at the same elevation on the second attempt; and two miles and a half at an elevation of 200 feet on the third flight. He would probably have completed the five-mile lap of the aviation field at Lakeview had not a stiff wind been blowing and had he not promised before starting to refrain from taking any untoward chances.

His flights proved beyond a doubt that still another type has been added to the several biplanes already in successful use and revealed a story of resolve to conquer the air that was carried out only after a solid year of hardest work and study.

The engine is a 50 horsepower Call aviation motor, two cylinders, double opposed, and weighing 200 pounds. It is connected to a wooden propeller 6½ feet in diameter and revolving 1,500 to 1,800 times a minute when the motor is running normally. The gasoline tank has a capacity of 10 gallons."

THE NORTHWESTERN AVIATION COMPANY

TACOMA, WASHINGTON

The Aerial Navigation Co. of America, January 22nd, 1911.
Girard, Kansas.

Gentlemen:—We send by mail today papers with an account of the first flights of the aeroplane in which the motor we bought from you is installed. The motor is working very satisfactory, and we are very much pleased with the way it is turning up. We thank you for the extra effort made by you on the engine, and will gladly answer any inquiry on behalf of the Call Motor. Yours very truly,

THE NORTHWESTERN AVIATION CO.
Per Guy B. Colvin.

SEND FOR CATALOG C3

We employ no agents; we cannot afford agents' commissions at these prices.

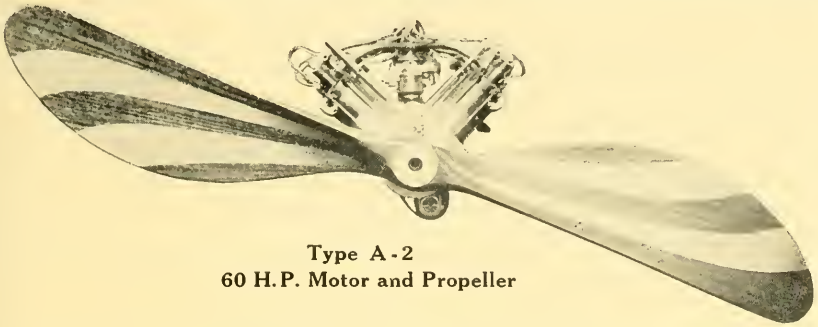
The Aerial Navigation Company of America

GIRARD, KANSAS

HALL-SCOTT

Aeronautical Power Plants

ENTHUSIASTIC OWNERS ARE THEIR STRONGEST ENDORSEMENT



Type A-2
60 H.P. Motor and Propeller

¶ Our four cylinder, 40 H. P., Type A-1 power plant will handle your Curtiss Type Plane in excellent shape.

¶ Our eight cylinder, 60 H.P., Type A-2 power plant will drive you much faster, and is the accepted type as used by Baldwin, Mars, Shriver, Masson, Frisbie, and many others.

¶ Our eight cylinder, 80 H. P., Type A-3 power plant is especially designed for professional high speed work, and for heavier planes, and is used by Hamilton and Wisemann.

¶ Any of these types can be safely used by beginners, as the flexibility of the motors allows a wonderful power control.

¶ Let us file your order for one of these types, and save experience cost on an inferior, and possibly lower first cost motor.

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San Francisco, Cal.

New York Representative
JOHN H. DAVIS
25 Broad Street

Can't Keep Our Balloons Down

PILOT ASSMAN TAKES LAHM CUP FROM FORBES, SAN ANTONIO TO GOWER, MO., FEB. 24, 1911,—715 MILES

"Miss Sophia," winner of the Lahm Cup—Feb. 24, 1911.

OUR Balloons Won National Contest 1909, also Made Good in National Elimination Races 1910—Result: The only Two American-made Balloons in the International Contest, St. Louis, Oct. 17, 1910.

BUILT thirty-four (34) Gas Bags in a Single Year More than All Other American Manufacturers Combined.

Can't We Build Yours?

Our Records:

CHICAGO—9 Competitors—Won both Distance and Endurance trophies by a big margin.—Water Record of the World—350 miles
INDIANAPOLIS—6 Competitors, 1st and 3rd prizes.
PEORIA—3 Competitors, 1st Prize.
ST. LOUIS—9 Competitors, 1st, 2nd and 4th Money.

CAN YOU BEAT IT?

How we do it: By using the very best material in the country; building on safe, practical lines, with good workmanship.

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Vol. VIII, No. 5. MAY, 1911 Serial No. 46

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MORE EVIDENCE

East St. Louis, Ill., March 20, 1911

DGE ENGINE COMPANY
Rochester, N. Y.

r wire and letter at hand. I'm depending on you for
Please hurry my engine along.

(Signed) J. N. SPARLING

East St. Louis, Ill., March 28, 1911

DGE ENGINE COMPANY
Rochester, N. Y.

en:—
ine received and installed; it runs like a charm,
the scales at 300 lbs.*** There is absolutely NO
TION on the 1911 Aero Special.

(Signed) J. N. SPARLING.

East St. Louis, Ill., April 6, 1911

ELBRIDGE ENGINE COMPANY
Rochester, N. Y.

Gentlemen:—

Your engine is in my new plane; it left the ground first trial and flew steadily for over a mile. The engine ran for over an hour and stopped only when I stopped it, and at no time was it overheated in the least. From all appearances it could have run all day.

I wish you to know that I am entirely satisfied with the engine and that I consider it the best aviation engine made in America. I have used four or five different makes, but the Elbridge always delivers the goods.

How soon can you send me another? I shall be ready for it next week.

Yours very truly,

(Signed) J. N. SPARLING.

ELBRIDGE AERO SPECIAL ENGINES FOR 1911 ARE PRACTLLY AUTOMATIC IN OPERATION. NO ADJUSTMENTS OF Y KIND FOR YOU TO MAKE. THEY FLY EVERYWHERE AND L THE TIME.

If you are interested in a first class aeroplane, completely equip- at $1250 to $1800, write us.

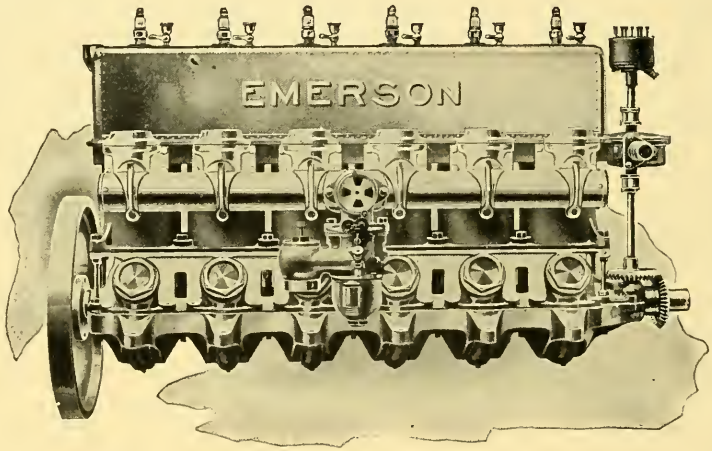
LBRIDGE ENGINE COMPANY

Culver Road Rochester, N. Y.

DON'T BE DISAPPOINTED

but get enough power to fly and not "cut grass"

¶ Profit by the experiences of others. The Engine that stands up to the work and is the "last word" in engine building. :: :: :: :: :: ::



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ANTONY JANNUS and REX SMITH at Washington, D. C., without a single accident. A record unequalled by the best of flyers.

Be "Wise" and get our Information

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J. R. Westerfield Telephone 782 Columbus

PALMER AEROPLANE TIRES

HAS IT ever occurred to you that if automobiles could be shod with inner tubes, without cases to protect them, they would be far easier-riding? Why? Because inner tubes are elastic, while cases (built of closely-woven, unyielding canvas) are not.

¶ The ordinary aeroplane tire is like the automobile tire. Being made of canvas, it has no elasticity. The canvas will stretch only to an insignificant extent, and the elastic limit of the canvas obviously fixes the elastic limit of the tire.

¶ Palmer Aeroplane Tires are fundamentally different. They contain no fabric. Around a pure rubber inner tube are wound strips of rubber in which are imbedded continuous linen threads running parallel. The threads in one ply are at right angles to those in the next; thus each layer supports and complements the others. There are four plies in Palmer Aeroplane Tires.

¶ Palmer Tires actually expand under a load. They are truly elastic. In a word, Palmer Tires possess the resiliency of air plus the resiliency of the best rubber, while ordinary tires possess the resiliency of air only. If there is any advantage to the aviator in using pneumatic tires, he will double the advantage by using Palmers. They are true shock absorbers.

¶ Palmer Tires are light but amply strong. They are made in any size, with or without lugs to bolt through the rims. They may be had with a puncture-preventing tread strip of imported chrome tanned leather In this form, Palmer Tires are more than ever the final word in aeroplane tire construction.

RUBBER SPRINGS

¶ We are making rubber springs of the Farman type from a compound of uncommon strength and proper elasticity. Send for a miniature free sample spring, and for prices of springs and tires.

The B. F. Goodrich Co.

Aeroplane Goods Department

AKRON, OHIO

Propeller Perfection

PALACE HOTEL SAN FRANCISCO

March 21, 1911

American Propeller Company.
Washington, D. C.

Gentlemen:

Beg to advise you that I received the 7' 9" propeller which you sent me and that the results obtained with the same are most gratifying.

To anyone contemplating the purchase of a propeller you may quote me as saying that I consider "Paragon in propellers the synonym of perfection in propeller construction at this date. You may rest assured that I will give you the order for the two propellers on the passenger machine which I am now building.

Thanking you again for the courteous attention and promptness with which you have made deliveries, I beg to remain.

Sincerely yours,
Chas. F. Willard

Mr. Willard telegraphs—"Standing thrust 390 pounds at 1100 revolutions, hard wood screw on Gnome engine (7¾ feet diameter by 5.70 foot pitch)."

Mr. Curtiss telegraphs—"Propeller developed as follows: No. 2 (7 feet diameter by 5.75 pitch) 360 pounds thrust at 1200 R. P M.; No. 3 (7 feet diameter by 6.20 pitch) 350 pounds at 1190 R. P. M. No. 2 very satisfactory in flight and probably nearest correct. Ship 7 foot 6 by 7 pitch to Belmont Park for Gordon-Bennett racer."

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Using a paragon Propeller Mr. GLENN H. CURTISS won the great speed contest at Los Angeles in 1910, defeating Radley (Bleriot), Ely (Curtiss), Parmelee (Wright), and Latham (Antoinette).

We have sold thousands of dollars worth of propellers with the remarkable record of not a single dissatisfied customer, and only one exchange for a different size or pitch ever being required.

We will send price-list and printed form for information about your machine so we can advise you just what propeller to use.

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American Propeller Co. Washington, D.C.

THE CURTISS WAR PLANE
CIRCLING THE WASHINGTON MONUMENT
MARCH 17th 1911 — NOW IN THE UNITED
STATES ARMY SERVICE
OF COURSE IT'S BOSCH EQUIPPED

SOME FACTS ABOUT SOARING FLIGHT

By E. F. Andrews.

COUNTLESS theories have been offered in the past in explanation of the phenomena of soaring flight. Although I have studied all the available matter pertaining to this subject I know of only two theories that seem to give the most plausible solution of this problem. One of these is the quite common conception of soaring flight as being made possible by rising air currents—the other is the action and re-action theory of Prof. J. J. Montgomery which though deep and difficult to understand, is so well in accordance with phenomena that actually take place that I am thoroughly convinced of its accuracy.‡

It is quite evident that birds do take advantage of rising currents to perform certain feats, but soaring flight is not dependent upon these. I had a good opportunity while on a trip to Florida by steamer of observing instances that illustrate this point. I have watched gulls following a steamer which was running against a stiff head wind. The birds could not soar fast enough to keep up with the vessel in the horizontal wind so they would flap their wings until they would reach the rising current caused by the wind being deflected from the deck.* Then they would decrease the angle of their wings thus decreasing the head resistance and thereby increasing their speed to that of the ship.

At other times during the trip when the steamer was running with the wind I have seen the gulls soar in wide circles around it. Sometimes rising, sometimes falling, and all without the stroke of a wing. Under these circumstances it would be impossible for them to take advantage of a rising current caused by the ship and a local rising current in mid-ocean would be highly improbable.

I have a good opportunity in Florida to watch the flight of soaring birds, notably hawks and vultures, and have proved to my own satisfaction that a bird can soar upward on motionless wings without the assistance of rising air currents.

‡This theory was presented to the aeronautical congress in 1893. Also treated in "Vehicles of the Air," by Victor Lougheed, and by Prof. Montgomery in AERONAUTICS.

*This rising current was located by liberating small pieces of tissue paper.

I once observed a turkey buzzard sailing over an open field at a height of about fifteen feet. He flew within a short distance of where I was standing so I could see him very plainly. Without once flapping his wings he rose a hundred feet or more in less than a half a minute and then sailed off until he was lost in the distance. I went to the spot immediately and released some light cotton fiber which I had with me for this purpose. It fell to the ground in a very short distance, thus proving the rising current to be nil or at least too slight to have any marked effect on the bird. Wilbur Wright has made the statement in the presence of the writer that his biplane gliders would glide over the face of a hill whose angle was so flat that turkey buzzards in order to fly over the same course were forced to flap their wings.

This is a very interesting observation but from my study of soaring birds I will take the liberty of saying that the subjects of these observations may not have been real turkey buzzards.‡ This I take from the fact that there are three kinds of vultures in our southeastern states. Namely, the carrion crow, the black vulture and the turkey buzzard. The only distinguishing feature of the latter variety is its slightly greater size and its red head, the heads of the other two species being black. The flight of the turkey buzzard is much superior to that of his black-headed relations. It is very seldom that he flaps his wings and when he does, it requires so much exertion on his part that it is impossible for him to make more than three or four wing strokes without stopping to rest. The other two vultures do not possess the wonderful gliding power of the turkey buzzard. On this account it is necessary for them to flap their wings at short intervals throughout their flight.

Owing to Mr. Wright's statement to the effect that he has never seen anything to make him believe that birds can glide at any flatter angle than the gliders of the present day I am inclined to think that his observations have been limited to vultures of the black-headed variety, for I have often seen the turkey buzzard make glides terminating several hundred feet higher than the starting point when all the means at my disposal failed to reveal an ascending current.

(Continued on page 177)

THE INFLUENCE OF MULTI-POINT IGNITION ON THE EFFICIENCY AND OUTPUT OF INTERNAL COMBUSTION ENGINES

By Otto Heins.

A GIVEN engine supplied with a given volume of uniform mixture will deliver its maximum output if ignition and combustion occur when the combustion space is of minimum volume, but up to the present this condition has been impossible to realize.

REASON FOR TIMING LEAD.

The time required for the propagation of the flame throughout the mixture has made it necessary to cause ignition before the piston reached the dead center. This entails a loss of efficiency, because, in the first place, the combustion space is not of minimum volume when pressure is produced; and, in the second place, because of the heat loss that will result from the long contact of the burning charge with an unnecessarily large cylinder wall surface. Further loss of efficiency may be traced to secondary effects, such as thrusts due to the unfavorable angle of the connecting rod, the less homogeneous quality of the mixture, etc.

TIMING RANGE.

With engines of automobile types, and at the piston speeds common to that class, the ignition lead required to compensate for the time of flame propagation varies from 15 deg. to 45 deg. In order to compensate for the mechanical and electrical lag existing in many ignition systems, it is often necessary to provide a considerably greater advance than even 45 deg. This timing range is usually controlled by hand, but in some instances automatic devices are provided for the sake of simplicity and to prevent the unskilful use of the spark control.

It is obvious, of course, that the maximum power production is identical with either of these two methods.

ADVANCE DUE TO TIME REQUIRED FOR FLAME PROPAGATION.

The lag existing in these ignition systems is eliminated in the true high-tension magneto, and with this instrument the only advance required is that necessary in allowing for flame propagation. The efficiency and output of an engine will increase directly with the reduction in the time required for flame propagation, and the conditions influencing this are of interest to the engine manufacturer. It is the function of an ignition system to raise certain particles of the mixture to such a temperature that they will ignite, and from this combustion center the flame spreads throughout the mass until all particles are inflamed.

MULTI-POINT IGNITION.

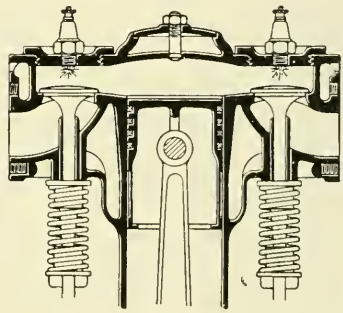
It is obvious that if ignition occurs simultaneously at two or more points properly located in the combustion space, the time required for the complete inflammation of the mixture will be reduced. As an every-day example of the application of this principle, it will be understood that if a sheet of paper is ignited at one corner the flame will have but one direction in which to spread, and combustion will proceed slowly. If the sheet is set on fire at the center, the flame may spread in all directions, and combustion will proceed somewhat faster. Obviously, the progress of combustion will be much more rapid if ignition occurs simultaneously at two or more points, as, for example, at opposite sides.

The advantage of two-point ignition has been thoroughly admitted theoretically, but practically the development of the idea has been hampered by difficulties in producing absolutely simultaneous sparks. A magneto has recently been introduced which solves the problem. As a result of the use of this instrument, ignition is produced simultaneously at two points in each cylinder, with the result that the time interval between the instant of ignition and the completion of combustion is very greatly reduced.

PLUG LOCATION.

Before proceeding with further explanations, however, it must be emphasized that the success of the system is dependent very largely upon the location of the spark plugs. If the spark plugs are placed in close proximity, as, for example, one vertically in an inlet valve cap, and the other horizontally in the side of the same pocket, there will be no noticeable difference whether ignition occurs at both spark plugs or at one, for in either case the flame must spread from one side of the combustion space to the other.

Fig. 1.



Location of Plugs in Test Engine.

If the spark plugs are located at widely separated points, as will be the case with one plug located in the inlet valve cap and one in the exhaust valve cap, then the distance through which each of the two flames must travel will be very considerably reduced.

Fig. 1 illustrates the cross-section of a "T"-head cylinder of standard design, and it will be noted that the spark plugs in this are located in the valve caps. It can be seen that the distance through which the flame must travel, if it originates at the two points simultaneously, will be much less than the distance to be traveled should ignition occur at but one point. The object of multi-point ignition is to reduce the time required for flame propagation as much as possible, and in this diagram it will be seen that there is a much greater volume of charge contained in the space between the two spark plugs than there is in the space between the individual spark plugs and the walls of their valve pockets. In other words, when ignition occurs at a plug, the flame will spread throughout the mixture in all directions, but a longer time will be required for the propagation of the flame from the plugs to the center of the combustion space than will be necessary in other directions.

A better arrangement of the plugs will be such as to require practically the same time for the spread of the flame from the ignition point through the charge in all directions.

OBSERVATIONS OF TESTS
WITH
SINGLE AND TWO POINT IGNITION.
PENN MOTOR SIZE $3\frac{9}{16}" \times 4\frac{3}{4}"$
CHESTER ENGINEERING CO

	ACTUAL COUNTER	ACTUAL R.P.M.	TORQUE LBS.	B.HP.
0° ONE SPARK	24350			
	23867	966	16.2	8.92
	22312	1174	15.4	10.3
	21085	1227	16.2	11.3
	19725	1360	13.2	10.2
0° TWO SPARKS	18765	960	25.2	13.9
	17597	1168	24.2	16.1
	16911	1372	23.8	18.6
	16152	1518	20.3	17.6
10° ONE SPARK	15648	1008	17.9	10.3
	15058	1180	16.7	11.2
	13649	1409	14.2	11.4
	12866	1566	11.4	10.2
	12216	1300	15.9	11.8
10° TWO SPARKS	11718	996	26.7	15.2
	11124	1188	25.7	17.4
	11594	1364	25.1	19.5
	10795	1598	23.4	21.3
20° ONE SPARK	9883	912	22	11.4
	9294	1178	22	14.8
	8593	1402	19.4	15.7
	7814	1558	16.8	14.9
20° TWO SPARKS	6821	993	28.5	16.2
	6240	1162	28.6	19
	5533	1414	27.7	22.3
	4737	1592	26.1	23.7
	3890	1694	24	23.2
32° ONE SPARK	53422	1114	25.9	16.4
	52767	1310	25.7	19.2
	51995	1544	24.1	21.2
	51108	1774	21	21.8
	50167	1882	19.6	21.1
32° TWO SPARKS	59877			
	59190	1374	29	22.7
	58415	1550	28	24.8
	57531	1768	26.5	26.7
	56575	1912	25.5	27.8
	55589	1972	24.9	28 ← ②
	54561	2056	23	27
	53979	1164	27.7	18.4
35° ONE SPARK	39399			
	38764	1270	26	18.8
	38030	1468	24.8	20.8
	37192	1676	23	22
	36251	1882	19.5	20.9
35° TWO SPARKS	46103			
	45511	1184	27.9	18.8
	44182	1329	27.4	20.8
	43367	1630	26.4	24.5
	42443	1848	26	27.3
	41445	1996	23.8	27
	39399	2092	22.6	26.9
40° ONE SPARK	51108			
	50000	1108	25.3	16
	48723	1277	25.5	18.6
	47949	1548	25	22.1
	47058	1782	23.5	23.8
	46103	1910	21.2	23.1
45° ONE SPARK	64639			
	64058	1162	25.8	17.1
	63358	1400	26.2	20.9
	62569	1578	25.5	22.9
	61731	1676	25	23.8
	60835	1792	23.5	24 ← ①
	59877	1916	20.8	22.7
50°	ONE SPARK	1904	18.6	20.2
40°	TWO SPARKS	2030	21.5	24.9

① MAXIMUM OUTPUT WITH 1 POINT IGNITION.
② MAXIMUM OUTPUT WITH 2 POINT IGNITION.

Length of Dynamometer Arm, 3 Feet. Torque Constant, .00057.

SIMULTANEOUS IGNITION.

Furthermore, the sparks must occur at exactly the same instant, for the slightest difference in the occurrence of the sparks will reduce the advantage of the system. For this reason it is essential to arrange a single source of current with a single circuit-breaker, for this is the only way to prevent the inaccuracies that will be the unavoidable result of the wearing of the parts.

TEST RESULTS.

A series of tests has been made on a 4-cylinder "T"-head engine, built by the Chester Engineering Company, mounted on the dynamometer of the Automobile Club of America, that illustrates the above facts.

The engine is 3 9-16-in. bore by 4¾-in. stroke, and is fitted with a two-point Bosch magneto controlled by a switch that permits ignition by either of the two series of plugs or by both. This gives a ready means of comparing the power output of single-point ignition with that of two-point.

Fig. 2 is a compilation of these results.

The greatest power output with single-point ignition with an advance of 45 deg. is 24 h.p., and the same output was attained with two-point ignition with an advance of but 19 deg. With two-point ignition the extreme power output with an advance of 32 deg. was 28 h.p. This is an increase of 4 h.p. or 16.6 per cent. over the best results with single-point ignition.

It will be seen that the use of a properly installed two-point ignition system will result in a great reduction of the necessary lead, and consequently in a corresponding increase in efficiency and output.

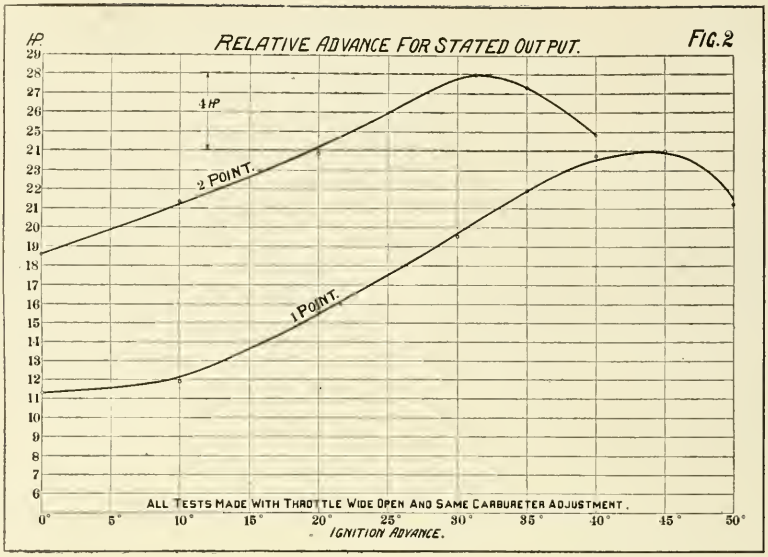
It will be observed from the curve that the number of revolutions at which stated power will be produced with two-point ignition is very considerably below the number of revolutions at which single-point ignition will produce the same power.

This indicates a corresponding saving in the consumption of fuel, and experience shows this assumption to be correct.

The development of multi-point ignition will undoubtedly result in a still greater advantage.

PRACTICAL APPLICATION OF TWO-POINT IGNITION.

Where the utmost power is not required, and where it is an advantage to simplify the construction and control as much as possible, the magneto should be given a moderate advance to produce approximately the same output as single-point ignition at the most favorable advance. This will permit fixed ignition to be used, and, in addition to the resulting simplification, it will insure the complete combustion of the charge under any condition. By using a switch permitting ignition on one series of plugs or on both, the effect of retarding is ob-



tained by employing but one series for starting and slow running, while both series may be used for operation at speed.

For commercial cars the use of fixed ignition of this character with a moderate advance will insure maximum economy and will protect the engine in a great measure from injury through the unskilful use of the controls.

In cases where the maximum output must be attained, as is required on racing engines for automobile, marine and aeronautic purposes, the most favorable advance should be selected (approximately 30 deg.) and hand control provided.

OTHER ADVANTAGES.

Aside from increasing the output, the system has the advantage of greatly reducing the ill effects of a defective spark plug or cable; inasmuch as the two plugs are in series with the armature, it follows that the failure of one of them will not interfere with the operation of the other.

PRACTICAL RESULTS.

As concrete examples of the results accomplished by this two-point magneto, attention may be called to the performances of winning cars in the racing events of the late season. The actual gain in speed on the road by the Marmon and Lozier cars, for example, as a result of changing from single-point to two-point ignition, was from 3 to 5 miles per hour, and the stock Lozier that established an American record by averaging better than 73 miles per hour at Santa Monica was equipped with a Bosch two-point magneto.

CONSTRUCTION.

In construction the two-point magneto is identical in every respect with the standard instrument, with the single exception that a second distributer is provided to serve the additional set of spark plugs. To this distributer is led that end of the armature winding which in the standard magneto is grounded. The timing is controlled by the single interrupter, which is standard in every respect.

ARMY TO HAVE 30 AVIATORS

THE first intimation the public has had of the plans of the Army in aeronautics since it received its $125,000 appropriation, was given out by Brigadier-General James Allen at the Aero Club banquet. This sum is rather small, but General Allen feels that the results will show our Missourian Congress the value of the aeroplane with a more liberal appropriation as a result next session.

After commenting on the surprise the first Wright machine furnished in 1907 and 1908 and the great 106-mile flight cross country of P. O. Parmalee and Lt. B. D. Foulois, and other flights made by them at the San Antonio mobilization, he said:

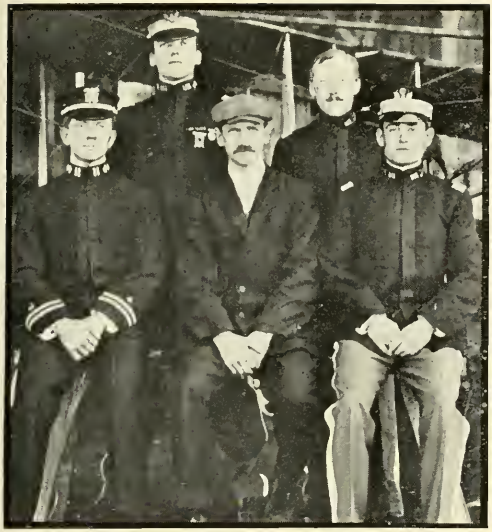
By General James Allen.

"We have also sent there from the Curtiss camp in California three officers who have been trained under Mr. Curtiss. We have sent them there to San Antonio in connection with one Wright machine and one Curtiss, so, in connection with Mr. Collier's machine, which he has loaned us, we will have three planes there. We have bought two.

TO BUY MORE AEROPLANES.

"We now desire to buy during the next year as many aeroplanes as we can buy from the amount of money appropriated, which is $125,000. We want to buy, first, aeroplanes that have demonstrated by actual flight and which are well known in the country, that are fitted for military work. We want to take over a certain number of them, and also to encourage as far as possible the building of all types of machines. We want to advance, as far as possible, the art of aviation through the entire country because, if anything occurs in this country where we would require the mobilization of a large number of troops, every aviator and every machine in the country would be necessary to carry out our wishes. The aeroplane as it stands to-day is a very valuable military instrument. What we want them to do is to do constantly and without fail the things they are doing to-day.

"We have at San Antonio a very fair place for flying. We have those machines. Another gentleman who has two other aeroplanes of a



Left to Right—Lt. Ellyson, U. S. N.; Lt. Beck, U. S. A.; G. H. Curtiss, Lt. Kelly, U. S. A., and Lt. Walker, U. S. A.

new type, as I believe, a very wealthy gentleman whom you all know, has put up two hangars there and shipped his machines down, and I hope to have quite a little aerodome there at San Antonio, perhaps five or six or seven machines.

"We are starting at Washington. We have a very fair ground there which we are going to fix up as best we can, probably three-fifths of a mile on each side. We will take it over just as fast as we can get the officers and men to train and get our hangars built. We will take over there a number of machines as fast as we can get them.

GOVERNMENT SHEDS FOR NOVICES.

"Perhaps in the next few months we will get four or five, and in addition to that we are going to ask everybody who has an aeroplane to go down there and we will furnish the hangars and they can train their men there. The Washington climate is perhaps a little better than New York. About nine months of the year there, there is perhaps not a day that you cannot fly. Quite a flight could be made away down the Potomac River and light right down on the ball grounds which end at the White House. It will make a great place for training people, and for people who want to fly it will afford a very delightful place. We have a fine reservation at Fort Riley and Fort Leavenworth, and I think at Governors Island; that place will be a good one, and also at West Point. We are going to try and put up these buildings on Government reservations as fast as we can, and I am sure the Government will allow anybody who wants to fly to come and put up their hangars on the Government reservations.

"There are flying-men now who are not so very expert, but we have no doubt in time they will accomplish all that is desired. We have not only got to train men to fly singly, but we have got to have a corps among them—have them fly in pairs. In France they are sending them all out in numbers of five and ten. We cannot hope this year to train more than thirty officers. If we do we will be very fortunate, but next year I think we will be able to train many more. It is very important to have trained aviators in this country if there should be any occasion for the mobilization of any large army for any purpose whatever. Aviators would all be in demand, and we want as many men and machines as we can get."

NAVY OFFICER TRAINS AT WRIGHT SCHOOL.

Lieut. John Rodgers, of the U. S. Navy, has completed his course at the Dayton field of the Wright Company, taking eight lessons the first afternoon and operating the levers himself during two of his lessons. He is so enthusiastic that he is planning to purchase one himself and not wait for the Navy order, which is expected in July.

A Wright machine is expected to be located at Belmont Park around the first of June for the instruction of students and the carrying of passengers.

Five or six men are at the Dayton camp of the Wright Company learning to fly; and while the weather is windy, the work is beginning to open up in fine shape.

The second unit of the Wright factory is started and will be completed within a month. This will give added facilities which are very much needed in the manufacturing department

Business on the selling end is reported as very good, the factory being loaded up with work for the next two months.

Lieut. Rodgers, of the United States Navy, despite almost continual bad weather, has completed his training at the Wright camp and on April 18th flew the machine alone for the first time.

Lieut. John Rodgers, U. S. Navy, in Wright Biplane—Note Extra Lever. Aviator Can Now Use Either Seat.

CLOSING CIRCLE AERONAUTICS RECORDS

By Geo. H. Scragg.

AT the last conference of the International Aeronautic Federation the system for keeping records, established previously by the Mixed Aerial Commission, of France, was modified and adopted. No notice will now be taken of world's records for 1 and 2 kilometers over a closed circle, nor a speed record not in a closed circle. The system is as follows: (1) Records of Speed, (2) Records of Time, (3) Records of Distance, (4) Records of Duration, (5) Records of Height, (6) Records for Climbing, and (7) Speed in Kilometers per Hour. These are classed as (A) records made alone, (B) records made with 1, 2, 3, etc., passengers.

These, in more extended shape, are as follows: (1) best speed over 5, 10, 20, 30, 40, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500 kilometers, progressing thereafter by 50 kils.; (2) greatest distance covered in ¼, ½, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 18, 21, 24 hours, and every 12 hours beyond; (3) longest distance; (4) longest duration; (5) greatest height reached measured above the starting point, each successive flight to be at least 100 meters higher than the previous one to constitute a record; (6) climbing speed, measured by 500 meters and in multiples of 500 meters, registered by a barograph, recording at the same time both altitude and speed; (7) speed expressed in kilometers per hour.

IN CLOSED CIRCUIT, WITHOUT STOP.

ONE-MAN WORLD RECORDS.

Duration—8 h. 12 m. 47.4 s.; distance made, 463.6 kils. (288.06 miles); H. Farman (H. Farman), Etampes, Fr., Dec. 18, 1910.

Distance—584.745 kils. (363.34 miles); time, 7 h. 48 m. 31.6 s.; Maurice Tabuteau (M. Farman), Buc, Fr., Dec. 30, 1910.

Altitude—3,100 meters (10,168 ft.); G. Legagneux (Bleriot), Pau, Fr., Dec. 9, 1910.

Speed (in K. P. H.)—109.24 (67.87 m. p. h.); Alfred Leblanc (Bleriot), Belmont, Oct. 29, 1910.

Speed Over Given Distances—

5 kil.—2 m. 44.78 s., Alfred Leblanc (Bleriot), Belmont Park, Oct. 29, 1910.
10 kil.—5 m. 30.92 s., Alfred Leblanc (Bleriot), Belmont Park, Oct. 29, 1910.
20 kil.—11 m. 04.78 s., Alfred Leblanc (Bleriot), Belmont Park, Oct. 29, 1910.
30 kil.—16 m. 38.31 s., Alfred Leblanc (Bleriot), Belmont Park, Oct. 29, 1910.
40 kil.—22 m. 12.58 s., Alfred Leblanc (Bleriot), Belmont Park, Oct. 29, 1910.
50 kil.—27 m. 48.70 s., Alfred Lablanc (Bleriot), Belmont Park, Oct. 29, 1910.
100 kil.—1 h. 0 m. 41.69 s., C. Grahame-White (Bleriot), Belmont Park, Oct. 29, 1910.
150 kil.—1 h. 43 m. 19.6 s., Emile Aubrun (Bleriot), Bordeaux, Sept. 14, 1910.
200 kil.—2 h. 18 m. 30.6 s., Emile Aubrun (Bleriot), Bordeaux, Sept. 14, 1910.
250 kil.—3 h. 4 m. 28.2 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
300 kil—3 h. 40 m. 55.4 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
350 kil.—4 h. 17 m. 26.2 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
400 kil.—4 h. 54 m. 6.8 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
450 kil.—5 h. 30 m. 35.6 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
500 kil.—6 h. 7 m. 7.8 s., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.

Distance for Certain Feriod—

¼ hour —25 kil., Alfred Leblanc (Bleriot), Belmont, Oct. 29, 1910.
½ hour —50 kil., Alfred Leblanc (Bleriot), Belmont, Oct. 29, 1910.
1 hour —95 kil., Alfred Leblanc (Bleriot), Belmont, Oct. 29, 1910.
1 hour —95 kil., C. G. White (Bleriot), Belmont, Oct. 29, 1910.
2 hours—167.5 kil., E. Aubrun (Bleriot), Bordeaux, Sept. 16, 1910.
3 hours—252.5 kil., E. Aubrun (Bleriot), Bordeaux, Sept. 16, 1910.
4 hours—325.905 kil., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
5 hours—407.675 kil., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
6 hours—490 kil., P. M. Bournique (R. E. P.), Buc, Dec. 31, 1910.
7 hours—522.935 kil., Tabuteau (M. Farman), Buc, Dec. 30, 1910.
8 hours—451 kil., H. Farman (H. Farman), Etampes, Dec. 18, 1910.

TWO-MAN WORLD RECORDS.

Duration—3 h. 19 m. 39.8 s., Amerigo (Aviatik), Germany, Dec. 11, 1910.

Distance—150 kil., Nieuport, Mourmelon, March 6, 1911.

Fastest Speed (in K. P. H.)—103.211 k. p. h, Nieuport, Mourmelon, March 6, 1911.

Altitude—428 m., Verschaeve, Belgium, Jan. 29, 1911.

Speed Over Certain Distances—

5 kil.—3 m., 15.8 s., G. Busson (Deperdussin), Rheims, Feb. 11, 1911.
10 kil.—5 m. 58.2 s., Nieuport, Mourmelon, March 6, 1911.
20 kil.—11 m. 54.6 s., Nieuport, Mourmelon, March 6, 1911.
30 kil.—17 m. 53.2 s., Nieuport, Mourmelon, March 6, 1911.
40 kil.—23 m. 57.6 s., Nieuport, Mourmelon, March 6, 1911.
50 kil.—29 m. 38.6 s., Nieuport, Mourmelon, March 6, 1911.
100 kil.—59 m. 16 s., Nieuport, Mourmelon, March 6, 1911.
150 kil.—1 h. 28 m. 37.8 s., Nieuport, Mourmelon, March 6, 1911.

Distance in Certain Period—

½ hour—23.54, G. Busson (Deperdussin), Feb. 11, 1911.
½ hour—46.515, G. Busson (Deperdussin), Feb. 11, 1911.
1 hour—101.25 kil., Nieuport, March 6, 1911.

THREE-MAN WORLD RECORDS.

Duration—1 h. 38 m. 40 s., J. Mamet (Bleriot), Rheims, July 9, 1910.

Longest Distance—110 kil., Nieuport, Mourmelon, March 9, 1911.

Speed in K. P. H.—102.855 k. p. h., Nieuport, Mourmelon, March 9, 1911.

Speed—

10 kil.—6 m., Nieuport, Mourmelon, March 9, 1911.
20 kil.—11 m. 59.4 s., Nieuport, Mourmelon, March 9, 1911.
30 kil.—17 m. 52.6 s., Nieuport, Mourmelon, March 9, 1911.
40 kil.—22 m. 44.4 s., Nieuport, Mourmelon, March 9, 1911.
50 kil.—29 m. 37.4 s., Nieuport, Mourmelon, March 9, 1911.
100 kil.—59 m. 8s., Nieuport, Mourmelon, March 9, 1911.

FOUR-MAN WORLD RECORDS.

Longest Distance—50 kil., G. Busson (Deperdussin), Rheims, March 10, 1911.

Duration—31 m. 23.2 s., G. Busson (Deperdussin), Rheims, March 10, 1911.

Greatest Speed (in K. P. H.)—96.308 k. p. h., G. Busson (Deperdussin), Rheims, March 10, 1911.

Speed Over Certain Distances—

10 kil.—6 m. 16.6 s., G. Busson (Deperdussin), Rheims, March 10, 1911.
20 kil.—12 m. 34.2 s., G. Busson (Deperdussin), Rheims, March 10, 1911.
30 kil.—18 m. 48 s., G. Busson (Deperdussin), Rheims, March 10, 1911.
40 kil.—25 m. 5.6 s., G. Busson (Deperdussin), Rheims, March 10, 1911.
50 kil.—31 m. 23.2 s., G. Busson (Deperdussin), Rheims, March 10, 1911.

FIVE-MAN WORLD RECORDS.

Duration—17 m. 28.2 s., Busson (Deperdussin), Rheims, March 10, 1911.

Distance—25.74 kil., Busson (Deperdussin), Rheims, March 10, 1911.

Greatest Speed (in K. P. H.)—87.254 k. p. h., Busson (Deperdussin), Rheims, March 10, 1911.

Speed—

5 kil.—3 m. 34 s., Busson (Deperdussin), Rheims, March 10, 1911.

10 kil.—7 m. 8 s., Busson (Deperdussin), Rheims, March 10, 1911.

20 kil.—14 m. 0.6 s., Busson (Deperdussin), Rheims, March 10, 1911.

ONE-MAN AMERICAN RECORDS.

Distance—101 miles 389 ft., Johnstone (Wright), Boston, Sept. 19, 1910.

Duration—3 h. 38 m. 49.5 s., P. O. Parmalee (Wright), San Francisco, Jan. 22, 1911.

Fastest Speed—67.87 m. p. h., Leblanc (Blériot), Belmont, Oct. 29, 1910.

Altitude—10,428 ft., Hoxsey (Wright), Los Angeles, Dec. 30, 1910.

Speed for 5-100 Kil.—See under "World Records."

Distance for Certain Period—

¼ hour—See under "World Records."
½ hour—See under "World Records."
1 hour—See under "World Records."

TWO-MAN AMERICAN RECORDS.

Duration—1 h. 12 m. 40 s., O. Wright (Wright), Ft. Myer, Va., July 27, 1909. Distance not measured.

THREE-MAN AMERICAN RECORDS.

Duration—2 m. 51 s., C. G. White (H. Farman), Belmont, Oct. 30, 1910.

WORLD FREE BALLOON RECORDS.

Distance—1,925 kil. (1,195 miles), Count de la Vaulx, Paris to Korostychew, Russia, Oct. 9-11, 1900.

Duration—73 h., Col. Schaeck, Berlin, Oct. 10-12, 1908.

Altitude—10,800 m. (35,424 ft.), Profs. Suring and Berson, Berlin, Germany, July 31, 1901. (James Glaisher claimed 37,000 ft. in 1862.)

AMERICAN FREE BALLOON RECORDS.

Distance—1,172.9 miles, Alan R. Hawley and Augustus Post, St. Louis to near Lake St. John, Que., Oct. 17-19, 1910.

St. Louis, Mo. Mar 21.—
H. E. Honeywell + 4 passengers.

HONEYWELL MAKES LONG TRIP.

SAN ANTONIO, Tex., April 10.—Lieut. H. E. Honeywell, who with his aide, J. W. Tolland, started at 6.35 in an effort to lift the Lahm Cup and break the world's long distance balloon record, descended at Little Rock, Ark., after traveling through the air 505 miles.

They landed 15 miles south of Little Rock, Ark., at 1.30 P. M., after being in the air 19 hours.

"Throughout Tuesday we sailed through favorable air currents, but exhausted them at altitude of 10,000 feet. We headed south with 30 sacks of ballast. We left San Antonio with 47. We encountered rain, thunder and lightning in the clouds all last night, and dodging thunder storms during the day, passed over Hot Springs twice within an hour."

When the start was made in the rain at San Antonio on Monday evening the big gas bag shot off in fine shape, sailing to the west. The wind was then blowing 30 miles an hour. The balloon was so ballasted that it immediately rose to a height of 2,000 feet, where the best currents north and northeast were to be found. Lieut. Honeywell hoped to land somewhere in Canada.

OTHER ASCENSIONS.

NORTH ADAMS, Mass., April 13.—With Leo Stevens as pilot and four passengers, the balloon Cleveland left here at 10 A. M. to-day for a trip over several New England States.

The passengers were Harry Brown, William M. Hilliard, Dr. Heber Bishop and Norman Prince.

The balloon landed at East Alstead, N. H., after a trip of 2½ hours.

FOUR JUST ESCAPE ACCIDENT.

ST. LOUIS, April 9.—Lieut. Andrew Drew, of the Signal Corps of the Missouri National Guard, pilot; Lieut. John P. Hart and Sergts. Bayard Brookman and Jos. Obermeyer, had a close shave in the St. Louis III when the balloon dropped so rapidly, after crossing part of the city, that 10 bags of ballast had to be cut loose one after the other to check the descent and the basket hit a chimney and then a rockpile, throwing out one passenger. It jumped again and made its final goal. No one was injured. The balloon was old and patched.

NORTH ADAMS, Mass., April 8.—H. P. Shearman, president of Williams College Aero Society, and John Haas, in the North Adams No. 1 to Lanesboro, being in the air for 2 hours 15 minutes. This is the first time Mr. Shearman has piloted a balloon.

ST. LOUIS, March 20.—H. Eugene Honeywell, Knox Taussig, Guy W. Taussig and Wooster Lambert in the St. Louis IV to Cairo, Ill.

Duration—48 h. 26 m., Clifford B. Harmon and Augustus Post, St. Louis, Mo., Oct. 4, 1909.

WORLD DIRIGIBLE RECORDS.

Distance—450 kil. (279 miles), "Bracciano I-bis," Naples, Italy, 1909.

Duration—7 h. 13 m., "Republique," Meudon, France, Aug. 4, 1909.

Altitude—1,650 m. (5,084 ft.), "Clement-Bayard," Sartrouville, France, Aug. 23, 1909.

AMERICAN DIRIGIBLE RECORDS.

Duration and Speed—U. S. Gov. No. 1, Capt. T. S. Baldwin, Ft. Myer to Cherrydale and return, Aug. 14-15, 1908. Dur. 2 h. 1 m. 50 s.; speed 19.61 miles per hour. Separate ascents.

WORLD KITE RECORD.

Altitude—23,800 ft., Mt. Weather Observatory, May 5, 1910.

WORLD SOUNDING BALLOON RECORD.

Altitude—29,040 m. (95,251.2 ft.), Royal Observatory, Brussels, Belgium, Nov. 5, 1908.

Whatever the value of the International Federation may be to aero clubs, it certainly is of little use for the keeping of records, which, until passed upon by this body, are not supposed to be records. Only lately has it made up a list of records to Dec. 31, 1910. Sets of supposed records sent the I. A. F. in December for correction never got back until March, until several letters had been written asking "why."

When received, they were useless for the purpose of knowing what were correct records, and what not. According to their list, Leblanc won the Gordon-Bennett, "Grimy" White carried two passengers 2 hours 51 minutes, and Hoxsey has the world altitude record of 11,474 ft., which latter has never been reported abroad by the Aero Club of America, for reasons explained heretofore.

Records given in the official organ "Aerophile," are left out finally in the "official" list of the I. A. F. If the I. A. F. and Aerophile don't know what are records and what not, who does? Accuracy, certainly, is not a strong point with the international body.

The above records comprise the I. A. F. figures, except where we know they are wrong. For the correctness of the others, we put our trust in God and shut our eyes.

The above foreign records have been compiled abroad and sent by our correspondent.

AERONAUTICAL MANUFACTURERS ASSOCIATION

ON April 29 there will be held at the Hotel Cumberland, New York, the organization meeting of the Aeronautical Manufacturers Association.

Following the launching of the project in the last issue of AERONAUTICS, an organization committee got actively to work and after a great deal of time and consideration had been given to the probable success of the scheme, decided to attempt the perfecting of such a body.

Tentative constitution and by-laws have been drafted for consideration at the coming meeting. Letters of invitation have been sent out to the legitimate manufacturers, jobbers and dealers in this country.

From the replies received thus far, April 20, the meeting bids fair to be a big one. Delegates are coming from the far West. Those who cannot come have written in expressions of co-operation. Long-distance telephone messages have been received, all enthusiastic as to the possibilities for good such an organization can be made.

A national law, such as holds in the marine industry, should be framed, instead of allowing any state to make its own freak laws, similar to the automobile licensing situation now.

The public must be shown that there is a really bona fide industry. At the present moment the "game" has no very enviable reputation.

The discouragement of exhibition flights by men who are not competent would go far toward raising the art and science from its present level. In the absence of a national law, it would create an increased number of men who hold Aero Club pilot licenses. This would benefit the Aero Club of America and its affiliated clubs.

The A. M. A. should deserve the support of every aero club in the country. The A. M. A. can do more to help the clubs than can be done in any other way.

The Organization Committee consists of E. L. Jones, publisher AERONAUTICS; A. W. Lawson, editor "Aircraft;" S. E. White, F. D. Wood, the White & Wood Co.; S. Y. Beach, "Scientific American;" John Trevor Custis, managing editor Philadelphia "Inquirer."

Purposes.

The general purposes for which the Aeronautical Manufacturers' Association is to be formed might be stated as follows:

To foster, promote and encourage the introduction and use of air craft of every character and description; to foster and promote the introduction of all means and systems of aviation; to establish, conduct and operate means and places of disseminating information as to the adaptability, construction and use of such means and systems of aeronautics and of air craft and their accessories, parts and equipment, and for such purposes to establish, conduct and manage exhibitions, displays, tests, trials and demonstrations in such form and manner as this corporation may adopt; to promote and encourage in all lawful ways the adoption and enforcement of laws and regulations providing for and securing safety, convenience and comfort in the use, keeping and operation of air craft, and of means and systems of aeronautics; to encourage and assist in the establishment and maintenance of improved courses, signals, signs of direction and all other means of rendering the use of air craft and all manner of air vehicles more secure and attractive; to afford opportunity to the members of associating and interchanging views with one and another, and establishing customs, plans and systems, to the end that the manufacture, disposition and use of air craft may be improved, the services to and the requirement of the trade better appreciated and fulfilled to the mutual advantage of the manufacturer, dealer and the purchaser of such vehicles and property; to gather, obtain and procure information and intelligence for the use and benefit of its members and to the credits and standing of firms, corporations and individuals; to do, perform, engage in such other things as may be incidental to or that may facilitate the purposes of this corporation

To arrange and care for the machines of members of this corporation at shows, race meets and other places.

To do any and all things in furtherance of the objects set forth above, or aid in the general advancement of the business, profession or trade of air craft of every description and any other manner or mode of travel through the air.

Suggested Work for the Association.

The promoters of all indoor aero shows would be obliged, in order to obtain exhibits, to show proof to the executive officers or the proper committee of ability to conduct a show properly and of financial resources sufficient to cover all possible indebtedness of the show, or furnish a bond covering this point. A vote by mail would be taken of all members and the majority vote would rule for or against the show. If in favor of it, the result would be a truly national representative exposition, to the benefit of the exhibitors as well as the promoter.

The Association would obviously be in a position to prevent any exhibition of a national character being held or given by irresponsible people.

The Association should require a percentage of net profits to be returned to exhibitors on a basis of space purchased by each. The Association could, when strong enough, conduct its own shows and possibly cover all the expenses of the exhibit.

The Association would be in a position to protect its members and individuals or others outside the body from unscrupulous schemers, promoters or impossible exploitations.

A system of credit information might be arranged for the benefit of members.

The Association by taking in only reputable manufacturers, jobbers or dealers, would be in a position to more or less discourage fraudulent and misrepresenting houses and promotion schemes.

Laws for the licensing of machines, traffic rules, transportation rates, etc., could be urged by an organized body such as this.

The establishment of a laboratory, similar to that of the Association of Licensed Automobile Manufacturers, might eventually result for the good of all members and others interested in the art and science of aviation.

The standardization of certain material, uniform formulas for horsepower, etc., the compilation of aerodynamic data, would in time be considered by the Association.

The upholding of patents, the restriction of dangerous practices, the investigation and exposition of frauds, the furtherance of endurance, speed and other tests, the arranging of tours, the elimination of the charlatan and aerial mountebank, and the uplifting of the industry in general should deserve the attention of this body.

As the Association grows with progress in the industry, new and fruitful fields will be discovered for cultivation by this body. It can be made a tower of strength to the industry and a monumental support to bona fide sporting and scientific institutions throughout the United States. These suggestions are but the first thoughts of some of those deeply interested in advancement who see the need for such an organization and observe the future possibilities for good.

(*Continued on page 179*)

NATIONAL COUNCIL AND AERO CLUB OF AMERICA

(AERONAUTICS has frequently been adversely criticised—by members of the Aero Club of America—for its rather independent attitude with regard to the club's deeds and shortcomings, and for the habit of telling readers its views.

To avoid any bona fide charge of unfairness, the club was actually asked to set forth in AERONAUTICS its views on the same subjects—and let the public decide as to any alleged unfairness. The offer was more than once refused.

In the complete history of the organization of the National Council, and its later meetings, which has been printed in AERONAUTICS, facts have been given with scrupulous detail, with the obvious conclusions, as they seemed to the magazine, pointed out.

The National Council has been accorded the privilege of as much space as might be necessary to show that the facts that have been stated are untrue, or that the conclusions are incorrect.

AERONAUTICS feels free to criticise or praise, where either is due. Its policy is always one unbiased. Its columns are open for the full airing of any grievance as to remarks for which the magazine stands sponsor.—THE EDITOR.)

PRECEDED the evening before by a dinner to the delegates to the National Council, with Robert J. Collier, the president of the Council, as host, the National Council held its third meeting at the Waldorf-Astoria on April 4.

Mr. Collier was thoughtful in entertaining his guests and had as the object a harmonious session of the Council, in which he was entirely successful. His efforts are indeed laudable, but, unfortunately, do not result in any strengthening of the body of which he is the head. The reverse is rather true. Mr. Collier should be given credit, however, for his good intentions.

The attention of the 17 clubs present out of the total of 30 clubs belonging to the "National Council of the Aero Clubs of America," as its official title now is, was directed mainly to adopting in almost its exact wording a new agreement of organization and set of by-laws presented by the special committee appointed some time ago by the Executive Committee. This special committee was entrusted with the labor of obtaining a working arrangement with the Aero Club of America and the preparing of a new agreement and by-laws. The new agreement and by-laws are abstracted as follows:

AGREEMENT OF ORGANIZATION.

Name changed to "National Council of the Aero Clubs of America."

Executive Committee will admit incorporated clubs of 25 or more members where the annual dues are not less than $5. Each club to pay to Council $50 annual dues, latter to have privilege of assessment to extent of further $50, except in case of college clubs, which obtain reduced rate.

Each club in Council may be represented by two delegates, only one of whom can vote. Each club has but one vote.

All powers of the Council are vested in Executive Committee, consisting of President, four Vice-Presidents and 10 Representatives to be elected at the annual meeting.

The Rules Committee is comprised of three appointed by President and two named by Aero Club of America. This committee is to carry out the rules of the International Aeronautic Federation at all meets.

The Contest Committee also has five members, two appointed by the President and three named by Aero Club of America. This committee is supposed to enforce rules and regulations for conduct of meets.

"The Aero Club of America is confirmed as the representative of America in the International Aeronautic Federation, and as such shall have and is charged with the duty and responsibility of representing the Council and the Members of the Council in all international affairs, and shall keep the Council advised at all times as to the progress and disposition of such matters."

The three paragraphs above cannot be changed by the Council without the concurrence of the Aero Club of America.

BY-LAWS.

The by-laws were passed as presented as a whole and, in general, conform to usual procedure. Below are the various committees provided for and the points relating to sanctions, etc., are mentioned:

The President can appoint the chairmen of the following committees, who in turn name their own committee members from delegates to the Council: Auditing, Membership, Law, Development, Transportation, Publicity, Academic.

One of the impossible duties of the Law Committee is the following: "To retain council * * * to prosecute or defend on behalf of the Council or any of its Member Clubs, such suits as may be necessary to assert or protect its or their property and rights, or to assert or establish any patent or other right of any person, firm or corporation, in any manner or thing directly or indirectly connected with the purposes and objects for which this Council is formed."

Clubs must pay $100 for a sanction for any meet or contest, which covers the first three days, and $30 thereafter for each day of the meet.

FEATURES OF NEW AGREEMENT.

The first by-laws and agreement of the Council provided for the naming of the head of the Council by the Aero Club of America, and the Council was called the "National Council of the Aero Club of America." At the December 6 (1910) meeting of the Council this privilege of naming the head of the Council was given up by the Aero Club.

A. C. A. GIVES ONE—TAKES TWO.

At the April 4th meeting of the Council the Aero Club allowed the Council to change its name by one letter, making it "National Council of the Aero Clubs of America," but gained two important points, i. e., the naming of two members on the Rules Committee and three members on the Contest Committee. Where the Club gave way in one point the Council gave way in two. Some of the delegates to the April Council meeting, men who were on the Council and Aero Club Conference Committees which drew up the new agreement and by-laws, were loud in their praise of the gracious attitude of the Aero Club and spoke of how much the Aero Club had given up—in fact, to hear them one would think the Aero Club had given everything to the Council save its virtue. The international relationship it could not give up, as that was a sacred thing, to be entrusted by the International Aeronautic Federation to no other body but the Aero Club of America.

To the onlooker and the aero club considering entrance into affiliation agreements with one or both of the two bodies, it looks as though the Council, since its capture at its organization meeting of June, 1910, had been thrown by the Aero Club of America, tied and branded; then turned loose to play.

A comparison of the privileges of affiliation with the Aero Club of America and membership in the Council is very much to the credit of the former body.

WHAT THE A. C. A. OFFERS AFFILIATED CLUBS FREE.

Sanction for meets, free.

Services of official observer, his help on organization, rules, etc., at expense of railroad fare plus $10 per day.

International recognition of all records.
The holding of international meets.
Representation in the International Federation through the Aero Club.
Members of affiliated clubs have same standing abroad as members of the Aero Club itself.
Pilot licenses for spherical and dirigible ballooning and aviation.
Barographs and other instruments at rental of $5.
Competition for Lahm Cup and any other trophies, and all events of Aero Club or National Council.
Competition in National Championship Balloon Race.
Participation in all events controlled by International Federation.

WHAT THE COUNCIL OFFERS MEMBER CLUBS.

Meet sanctions at $100, plus $30 per day.
Competition in events sanctioned by Council.
International recognition of records if passed by Council on to Aero Club and by latter to the Federation, provided a representative of the Contest Committee of the N. C. be present when records are made.

REPORTS AND RESOLUTIONS.

The admittance to the Council was reported of the Aero Club of Nebraska and the Milwaukee Aeronautic Society.

Dr. A. F. Zahm was appointed a committee of one to draft proper resolutions congratulating Glenn H. Curtiss upon attaining so great a degree of success with his water machine.

On motion of Mr. Plew, the President was authorized to appoint a committee to confer with the Aero Club of America and discuss the question as to whether or not membership in the Council amounted to the same thing as affiliation with the Aero Club of America; a number of aero clubs being already affiliated with the A. C. A. W. W. Miller, who, with Robert J. Collier, was the Aero Club's delegate to the Council, said he saw no reason for future existence of affiliation agreements between other clubs and the Aero Club of America. It is safe to assume, however, that this view is not shared by the governors of the Aero Club of America.

INTERNATIONAL BALLOON RACE FOR KANSAS CITY.

The National Council at its April 4th meeting accepted the report of a special committee which favored Kansas City as the site for the Gordon Bennett balloon race on October 5. The elimination race to select the American team will take place July 10, at Kansas City. There will be nine balloons in the international event, three each from Germany, France and America. For the elimination race one balloon has already been entered by the Western Aero Association, the "Topeka."

The National Council was allowed by the Aero Club the privilege of naming the place for the holding of the international event this year. The new by-laws do not provide for such privilege in the future.

Kansas City has natural gas, which is popularly supposed to be of little use for ballooning, and particularly bad for racing. The gas company, however, states that by treating the natural gas it can be made as light at least as coal gas, with a specific gravity of .37 to .40. One million cubic feet can be supplied through a 16-inch pipe. The natural gas is passed over a bed of incandescent fuel to increase its lifting capacity. Kansas City agrees to offer $3,000 in prizes. The $5,000 heretofore put up by Bennett, the donor of the cup, is not offered this year. For the elimination race, free gas and "suitable" prizes are offered.

HOW TO MEASURE THE PITCH AT ANY POINT OF AN EXISTING PROPELLER

By Hugo C. Gibson

AT any distance from the hub mark points A and B upon the entering edge and the leaving edge. The angle of the line joining these points in relation to the plane of revolution of the propeller is the angle at which the air is attacked. The proportion of the propeller blade occupying the position of that angle would, in making one revolution, assuming that there be no slip, advance a certain distance through the medium upon which it is acting; in this case, air. This distance is the pitch, and to determine its magnitude proceed as follows:

From a table of tangents, which may be found in any engineering book such as Kent's, find the tangent of the angle which was measused as indicated above. Then form the equation

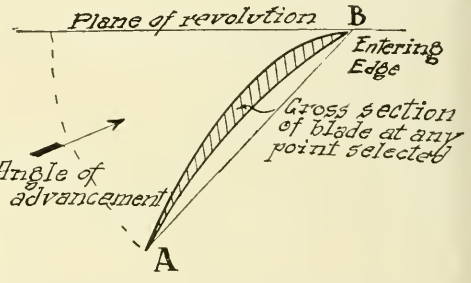
$$\tan A = \frac{P}{3.1416 \times D}$$

where D = the diameter of the circle swept by the points A and B and P = pitch.

Taking an instance: Mark the point A B at a radius of 3 ft. from the center of the propeller hub. Then those points will swing in a circle 6 ft. diameter, therefore, D = 6 ft.

Suppose the angle of the line A B to be at 17° 30", then the tangent of the angle 17° 30" is found from the table to be .31530. Substitute these figures in the equation, which then becomes $.31530 = \frac{P}{3.1416 \times D}$ ∴ $P = 3.1416 \times 6 \times .31530$ ∴ P = 5.94 feet.

The same process can be repeated at each position along the blade, taking a new D each time.



John C. Montgomery, who presided in an original manner at the last annual dinner of the Aero Club of America, practically admitted that he did not know an aeroplane from a meridian of longitude, and that before introducing the speakers of the evening he had sought enlightenment from Allan A. Ryan, the Wall Street president of the organization.

"I have studied 'Young's Night Thoughts,'" said Mr. Montgomery, "and 'Pilgrim's Progress.' Never before this afternoon have I studied aeronautics. I purchased an aeronautical magazine to-day to read on my way to this dinner. And I want to tell you frankly that as far as I am concerned I prefer 'Young's Night Thoughts.' So in my desperation for some definite information as to what aeronautics was all about, I applied to your president, Mr. Ryan. And Mr. Ryan's reply was: 'How the hell should I know?'"

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THE NEW FRAUD MEDIUM

THE editorial in the last issue of AERONAUTICS, entitled "Stop! Look!! Listen!!!" has brought out a wave of complimentary criticism from all over the country.

The art and science of aeronautics is being made the medium for numberless schemes and stock flotations; many purely fraudulent, others close to the border line.

Schemers are getting men with capital to back them, they buy or build an aeroplane and solicit students at flight under the tutelage of "So-and-So." Those who know the tutor are familiar with the fact that he has never been in an aeroplane, yet he advertises to teach flight.

Concerns advertise Curtiss or Bleriot machines at ridiculous prices—they do not even say "Curtiss-type" or "Bleriot-type" to distinguish bad copies from originals. All the automobile journals seem anxious to run half to full page advertisements, and even some of the aero papers fall for the contract. When the advertising bills are presented for payment there is "nothing doing;" perhaps one more insistent than another obtains a judgment. The advertiser immediately sells out the business.

The small towns are imposed upon by schemers and publicity campaigns are started to spread the news of a long-distance flight of several hundred miles or more from some place to the town doing the publicity work. An investigation of the mode of transportation shows up a photograph of a small model in flight, represented as the machine itself. Flights are claimed at some of the known aviation fields, where the aviator who is to make the wonderful flight is in fact unknown.

Engine manufacturers are constantly asked to furnish an engine for some 'plane, with great publicity to result to pay the engine maker for his share in the enterprise. Search often finds the aeroplane on paper only, a poor copy of some well-known type of machine, or the operator is totally inexperienced despite his claims to fame. Such a combination of engine maker and aviator is perfectly legitimate, of course, when the builder is honest and means to do his best; but more frequently the opposite is true.

Schools of aviation are being established about the country. These sometimes consist of nothing more than a desk, typewriter, stenographer and the "professor." How can one learn the science of aviation unless the instructor knows something of it himself? How can one learn the art of flying unless the school has a machine capable of successful flight? Prospective students should be sure that the school has at least these two advantages.

Various ones are entering the exhibition field, to the great disappointment of the public which pays. Boards of trade in small towns are contracting for flights with aviators who claim great records abroad, or at Mineola, or elsewhere; but these aviators are either unknown or unfavorably known at all these aviation centers. The day of the exhibition sees some poor attempts to get off the ground, or at best a short straightaway flight, and the management settles all or a portion of the agreed amount and vows "never again."

To the man with little money but a great ambition to become a famous aviator, working with every cent he can scrape up and his abundance of energy, to schools who have something definite to offer, to the small manufacturer of 'planes who is trying to sell where he can an honestly built machine capable of flight, to anyone legitimately offering anything to the public in the line of aeronautics, there are none but extend the very best wishes for success. But for the man who is using the aeroplane, like many another great invention as a vehicle for misrepresentative and fraudulent exploitations, there is nothing deserved but condemnation and exposure.

AERONAUTICS would like to hear from all who read this. If you know of any fraudulent operations write a letter stating the mere facts as you know them. Your letter will be held strictly confidential. If you can put your statements in the form of an affidavit, so much the better. If you can give the name of others from whom information may be secured, please do so. If the facts are borne out by investigation it is planned to present the evidence to the Post Office Department for its action.

If the "game" is to take its proper place and progress with the rapidity which its importance demands, it must be kept free from the

Continued on page 181

HOW TO BUILD A CURTISS-TYPE BIPLANE*

By G. H. Godley

(Continued from April number)

Reference to drawings will show that two diagonals run from the front wheel up and back to the top of the main frame, and two more from the wheel forward to the short cross-pieces near the apices of the A-frames; there is also a vertical strut which intersects two horizontal pieces running between the ends of the longer cross pieces of the A-frames. Altogether, there are five attachments on each side of the front wheel, through which the able bolt must pass; namely, the connections to the skid, to one of the diagonals to the engine bed, to one of the rear diagonals, to one of the front diagonals, and to one side of the fork carrying the vertical strut. Of these the skid attachments should be on the inside, closest to the wheel, and the engine-bed diagonals next.

The four additional diagonals running to the front wheel may be spruce of the same section used in the A-frames, or turned 1 inch round. At each end they have flattened ferrules of steel tubing. The beams of the A-frames have similar ferrules at the ends where they attach to the main frames. These attachments should be made on the socket bolts of the struts on either side of the middle 6-foot section, and on the outer side of the main beams—not between the beam and the socket itself.

It is possible to make all the A-frames and diagonal braces of bamboo, if desired. Bamboos for this purpose should be between 1 and 1¼ inches in diameter; where ferrules are fitted on the ends the hole of the bamboo should be pluggd with wood, glued in place.

Generally in the construction of the outrigger frames the builder can use his own discretion to a considerable extent. There are innumerable details which can be varied—far too many to consider even a part of the possibilities in this limited space. If the builder runs across any detail which he does not see mentioned here, he may safely assume that any workmanlike job will suffice. Often the method may be adapted to the materials which the builder has on hand. The diagonal wires from the cross-pieces of the A-frames to the struts should be crossed.

RUDDER AND TAIL CONSTRUCTION.

The frames for the rudder and tail are constructed in much the same way as those for the elevator. Spruce sticks 1 by ½ inch are used throughout except for the piece at the back edge of the rudder and the long middle piece across the tail; these should be 1½ by ½ inches. This long middle piece of the tail is laid across on top of the rest of the framework; when the cloth is put on, this makes the upper surface slightly convex, while the lower surface remains flat. The ends of this piece should be reinforced with sheet steel, fairly heavy, and drilled for ¼-inch bolts attaching the tail to the A-frames.

The rudder is hung from two posts extending above and below the tail. These posts may be set in cast aluminum sockets, such as may be obtained for 20 cents apiece from any supply hoase. The posts need not be more than ¾-inch in diameter. At their outer ends they should have ferrules of steel tubing, and the turnbuckles or other attachments, for the truss wires are atached by a wood screw running into the end of each. From these posts the rudder may be hung on any light hinges the builder may find convenient, or on hinges improvised from screw eyes or eye-bolts, with a bolt passing through the eyes of each pair.

In steering, the rudder is controlled by a steering wheel carried on a hinged post in front of the operator. This post should be ash about 1 by 1¼ inches. It hinges at the bottom on a ½-inch steel tube passing through it, supported at the ends on the diagonal beams to the engine-bed. Two diagonals of lighter tubing may be put in to hold the post centered between the two beams.

The post is, of course, upright, and the hub of the wheel is horizontal. The wheel may conveniently be mounted on a piece of tubing of the same size as the hub hole, run through the post, and held by a comparatively small bolt running through with a big washer on each end. The wheel is preferably of the motor-boat variety, with a groove around the rim for the steering cable.

The rear edge of the tail should be about an inch lower than the front. To make the rudder posts stand approximately vertical, wedge-shaped pieces of wood may be set under the sockets.

The steering connections should be of some of the flexible cables that are made for this purpose. There should be a double pulley on the post just under the wheel, and the cable should be led off the post just at the hinge at the bottom, so that swinging the post will not affect it. The cable is then carried under the lower main plane and out the lower beams of the A-frames. It is attached to the rudder at the back edge; snap-hooks should be used for easy disconnection in packing. Perhaps the best way of guiding the cable is, instead of using pulleys, to run it through short pieces of tubing, lashed to the beams with friction tape. The tubing can be bent without flattening by first filling it with melted lead, which after the bending can be melted out again.

AILERONS FOR LATERAL STABILITY.

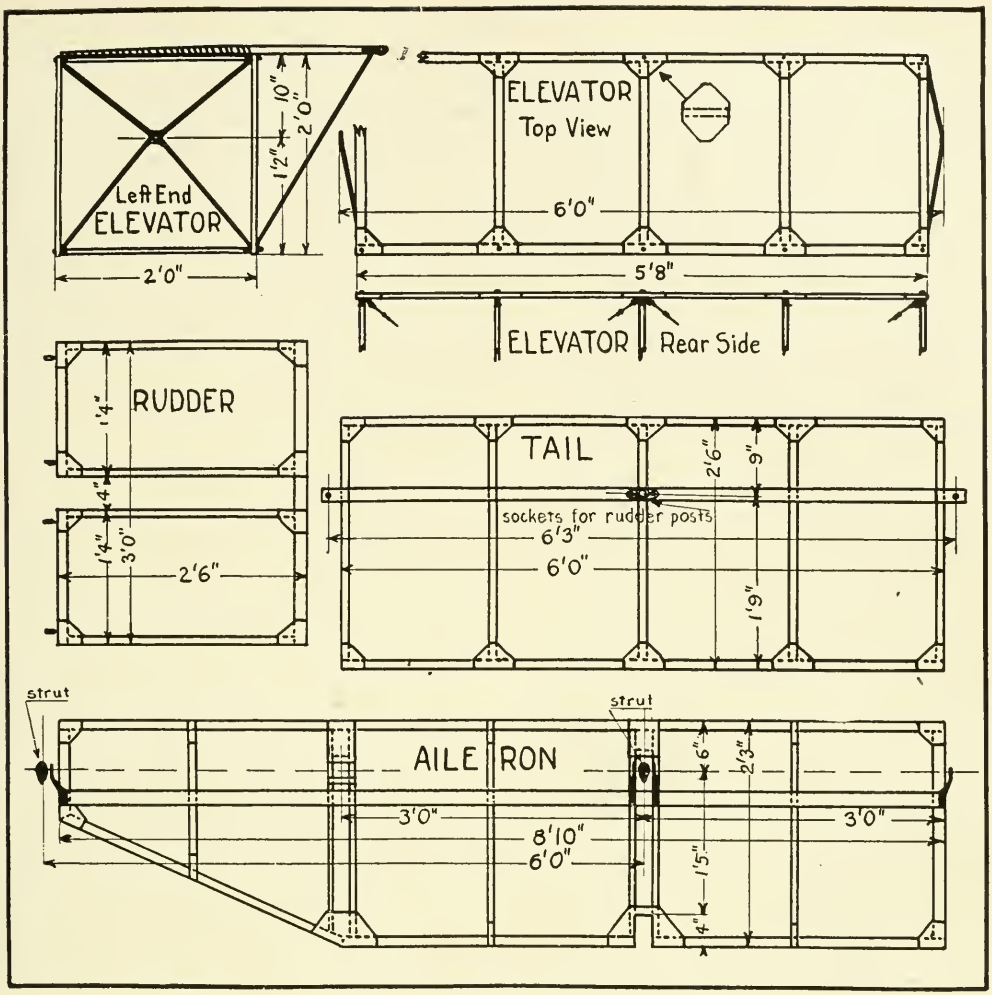
The frame-work of the ailerons is made in the same way as that for the elevator, tail and rudder. The pieces around the edges should be 1½ by ½ inches, as also the long strip laid over the top of the ribs. The ribs should be ½ by ¾ inch. Each aileron has two holes, one for the strut to pass through, and the other for the diagonal truss-wires at their intersection. The back edge also has a notch in it to clear the fore-and-aft wires. Each aileron is hung on four strips of soft steel about ½ by 1/16-inch, twisted so that one end is at right angles to the other. These are arranged one on each side of the strut which passes through the aileron and one at each end. Bolts through the struts carry three of them, and the outer one is trussed by wires to each end of the outer strut.

A frame of ¼-inch steel tubing fits around the aviator's shoulders and is hinged to the seat, so that he can move it by leaning to one side or the other. This is connected by flexible cable to the rear edges of the ailerons, so that when the aviator leans to the left he will raise the left and lower the right aileron. The upper edges of the ailerons are directly connected to each other by a cable running along the upper front beam, so that they must always move together.

CLOTH COVERING OF THE PLANES.

Many different materials can be used successfully for covering the planes, and the materials chosen will depend largely on the condition of the builder's pocketbook. About 55 square yards of material will be required (in comparing prices per yard always consider the width, as this may vary from 28 to 50 inches). Rubberized silk, which is used on the standard Curtiss machines, is the most expensive covering; its cost may run up to a couple of hundred dollars. There are also several good aero cloths on the market which sell at 60 cents a square yard. There are also several brands of varnish, most of them,

* *Begun in the February number.*



Construction of Frames of Elevator, Rudder, Tail and Ailerons.

however, quite expensive. The cheapest way, and one which will give good satisfaction, is to use a strong linen cloth coated with shellac.

Covering the planes with the cloth may well be postponed until after the engine has been installed and tested, thus avoiding the liberal splashings of oil and dirt which the cloth would otherwise receive during this process. For the sake of completeness, however, the covering will be considered here, with the above understanding.

First, the wire to which the cloth is laced must be strung along the rear ends of the ribs of each plane. The wires pass through holes in the ends of the small ribs and are attached to the main ribs with turnbuckles. At the end of the planes the main ribs must be braced against the pull of the wire by a piece of ¼-inch tubing running from the end of the rib diagonally up to the rear beam. Both turnbuckle and tube are fastened with one wood screw running into the end of the rib.

The cloth should be cut to fit the panels between the main ribs and hemmed up, allowing at least an inch in each direction for stretch. Small eyelets should be put along the sides and rear edges an inch apart for the lacing. At the front edge the cloth is tacked directly on to the beam, the edge being taken well under and around to the back. Strong fish-line is good for the lacing.

After the cloth is laced on it must be tacked down to the small ribs. For this purpose use upholstery tacks; they have big cup-shaped heads which grip the cloth and do not tear out. As an extra precaution a strip of heavy tape may be run over each rib under the tack heads. All the control members are covered on both sides, the edges being folded under and held by tacks.

Albert Filieux, who flew with the late John Moisant from Paris to London, has come back to America with a 50 Gnome Bleriot, with which he promises to fly from Van Cortlandt Park down Broadway to the Statue of Liberty. He obtained his license in record time and has a letter from Bleriot himself complimenting him upon his prospects for becoming one of the great aviators.

FLIGHT PROGRESS ABOUT THE COUNTRY

JANNUS TAKING PASSENGERS.

The Rex Smith headless biplane has been doing its flying the past month at the Polo Grounds in Washington, instead of at College Park. Many notables have been carried, among them some women. Two passengers were carried on one flight, making the weight lifted 1,457 lbs. The power plant is made up of an Emerson 100-h.p. engine and Paragon propeller.

Antony Jannus, the aviator, has been practicing short turns and gliding with the motor throttled down. The extensions on the upper plane were removed, reducing the spread from 40 ft. to 32 ft. This, however, increased the speed and lateral stability.

WIRELESS USED.

The week of April 3, Rufus R. Bermann, of the Signal Corps Wireless Laboratory, was taken up and messages from the aeroplane were received at the shed and at the laboratory. The best lady passenger was Miss Elenora Rivera, daughter of the Cuban minister.

PONTOONS TRIED.

The builder of the machine, Rex Smith, is the owner of a patent on hydroplanes as applied to aeroplanes.

On April 15th the first and only trial was made. The aeroplane, fitted with a pontoon fastened to the skids, 8 inches high by 14 feet long, was launched from the sea wall. The water was shallow here and the pontoon rested on the mud bottom, although this was not seen at the time. As soon as the edge of the deep dredged channel was reached, the greater weight of the machine being forward of the center of gravity with the pontoon on, caused it to dive head first. Jannus was carried under and had to disentangle himself and swim clear of the wires. A man who could not swim would have been drowned.

Flights from land were again made on April 18, one of 12 minutes' duration. Complete circles were made, shorter than McCurdy's when he was in Washington with the Curtiss army machine. In landing, the soft mud caught the wheels and skids and the impetus of the aeroplane threw it on its nose. Its strong construction saved it from damage. Bystanders righted it and it was run under power to the tent.

The biplane is now back in its shed at College Park. It will be seen at the Bennings racetrack flights, where the Curtiss aviators are to give an exhibition.

BURGESS BIPLANES AT MINEOLA.

On April 12 the first Model F Burgess biplane, "The Moth," known as the Burgess-Wright aeroplane, arrived at Mineola from the factory of the Burgess Company and Curtis at Marblehead, Mass. The biplane was taken to Mr. Harkness' shed the same afternoon and was set up before nightfall. Early the next morning, April 13, W. Starling Burgess, the builder, took the machine to the aviation field, and without waiting for any preliminaries started the biplane off on a ten-mile flight. The aeroplane rose smoothly and circled outside the limits of the aviation field under perfect control. In fact, the control proved so well balanced that Mr. Burgess was enabled to take his hand from the levers in order to wave back the crowd while turning just before landing after completing four circuits outside the field. He reported the balance as being better than on the original Wright machine on which he learned last winter in Augusta, Ga.

After sixteen minutes of flight Mr. Burgess, with an engineer's caution, brought his machine to earth and took down the motor to make sure that all parts had operated correctly. Everything was found in perfect condition throughout. By the time the motor was re-assembled, however, the wind had increased and further flights were impossible for that day. Mr. Burgess received the congratulations of the interested onlookers for making such an unusual maiden flight on the first attempt.

The machine, in fact, had not been under power before that morning.

The Burgess-Wright aeroplane, manufactured under license from the Wright Company, is a duplicate of the latest Wright with the 35-h.p. Wright power plant. The power plant and transmission were furnished by the Wright Company. While built on the same lines as the Wright model, the Burgess Company and Curtis have, however, introduced many minor modifications, all of which add either to the strength or to the finish of their Model F. The value of these slight changes is more apparent to the constructor and the connoisseur than to the general public, as most of them are inconspicuous, and, in fact, some of them are completely hidden within the surfaces. The outside finish is up to the high standard which has made the Burgess racing yachts famous in Eastern waters. The woodwork has a coat of spar varnish over the alum-

Jannus Carrying Serg. Wilson, U. S. Signal Corps.

inum paint. All metal parts are nickel plated. The brasswork is polished and the whole machine is finished and maintained in apple-pie, ship-shape order. As a finishing touch a small signal staff is mounted on the front skid, where it carries the Burgess private signal, first made familiar on the Burgess cup defender "Puritan." The equipment includes a Mea magneto and an imported revolution indicator conveniently placed in front of the aviator. A light automobile clock is also mounted on one of the skid struts.

A critical inspection of the biplane showed the main body in perfect alignment and so rigid that no deflection was observable either in the front truss or in the tail when the weight was unevenly supported by lifting up either extremity. This machine is of the "headless" type and is controlled by the well-known Wright flexible rear elevator and box vertical rudder.

While future Burgess-Wrights and Grahame-White "babies" will be covered with Goodyear No. 10 aeroplane fabric, the present aeroplane uses the special sail cloth known as Union Silk, furnished and cut by Messrs. Wilson & Silsby, the Boston sail makers. Goodyear 20x2 inch aeroplane tires are used, mounted with the usual Wright suspension. As may be inferred from the foregoing, the Wright Company co-operates heartily with the Burgess Company and Curtis in the construction of these machines.

HAMILTON BUYS BURGESS BIPLANE.

On April 15 Charles K. Hamilton bought the new Burgess-Wright biplane which had arrived at Mineola but three days before. Hamilton was so enthusiastic over the workmanship of the Burgess product that he at once gave up his trip to France, which he had arranged for the present month, planning to buy there a Maurice Farman biplane with Renault motor. Mr. Hamilton declared the Burgess biplane to be superior to any other machine in existence.

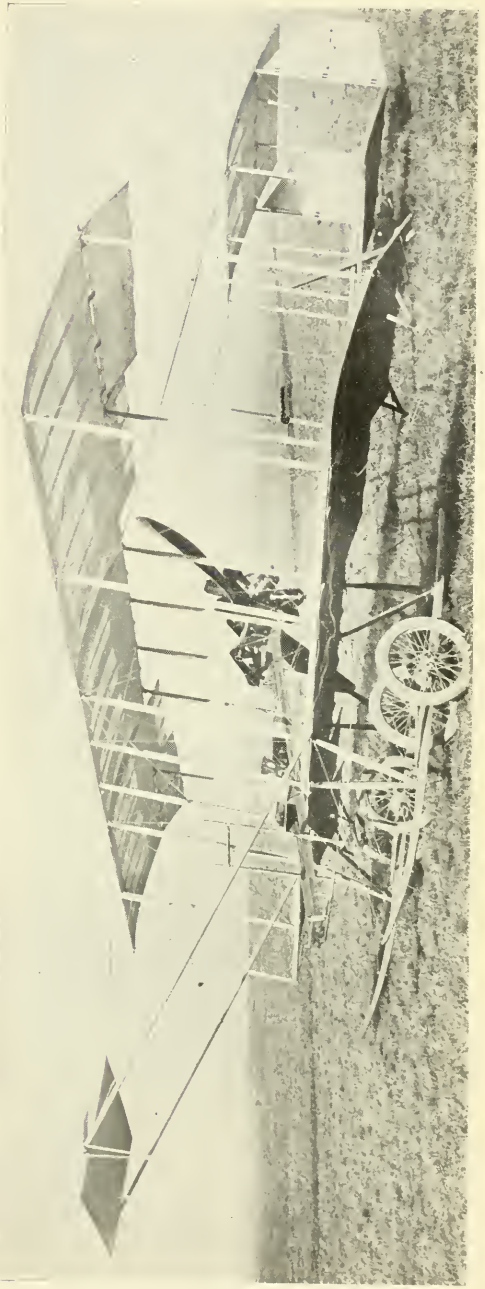
As this purchase would deprive the Burgess Company of its best school machine, and would thereby interrupt the classes in aviation which had already been organized, Hamilton generously offered to take over the Burgess students himself and instruct them on the new machine. He had the biplane shipped the same night to Hartford, Conn., where he will instruct Messrs. Atwood, Hammond and other Burgess pupils at the earliest opportunity.

Another Burgess-Wright aeroplane will be shipped to Mineola from the Marblehead factory on May 1st. It is planned that Mr. Burgess shall give instructions at Mineola on the later machine. A number of pupils are waiting for their lessons on this biplane.

HILLIARD HAS MOTOR TROUBLES.

The first school biplane (Model D) of the Burgess Company and Curtis has been at Mineola since March 20, awaiting favorable weather for instructing a class of aviators in its management. W. M. Hilliard, the instructor, has made several flights during the period of waiting, but the weather has been too severe to permit pupils to go up.

On April 17, however, Hilliard started out with A. Leo Stevens as passenger for a cross-country flight. He had gone hardly two miles before motor trouble developed, the motor stopping short in mid-air. Owing to the nearness of the motor parkway bridge and fences, Mr. Hilliard had no opportunity to find a smooth landing place, but was forced to come down in a cramped position so abruptly that parts of the biplane broke and the aviators landed on the ground. Luckily neither was hurt and the machine was soon back in quarters. Owing to the unfavorable weather conditions to be expected at Mineola for the next few weeks, the machine has been shipped to Boston, where it will probably be returned to service in the Burgess Company's school at Squantum as soon as the weather permits.



The Burgess-Curtis-Made "Grahame-White Baby."

While the landing was so abrupt as to be startling to the occupants and to drop them and the motor on the ground, nevertheless it was not severe enough to injure the running gear, and only a few wooden parts were broken.

The Burgess Co. and Curtis have ordered a Gnome 50 engine from the Aeromotion Co. of St. Louis.

MR. AND MRS. COFFYN FLY IN GALE.

To Mrs. Frank Coffyn belongs the honor of having made the longest flight, in duration and distance, of any woman in the United States.

At 7.40 on the morning of March 30, Mr. and Mrs. Frank Coffyn left the Wright Company's Augusta (Ga.) instruction camp on Monte Sano hill in the Model B Wright machine and flew to the winter resort Aiken, S. C., a distance of 30 miles by the route taken, in 41 minutes, alighting on the polo field there at 8.21, in time to breakfast with Mr. and Mrs. Thomas Hitchcock.

There was a fair wind blowing when the start was made, but before reaching Aiken it had increased to around 25 miles an hour, and very gusty. Mr. Coffyn was extremely busy with the management of the machine during this time and a little concerned as to how Mrs. Coffyn would take the pitch and swing of the machine at the height of 500 feet that they were traveling; but she showed a whole lot more nerve than many a male passenger in an aeroplane and enjoyed the jaunt hugely. Twenty minutes after alighting, the wind had increased to such a velocity that it was uprooting trees.

Mr. and Mrs. Frank Coffyn After the Flight.

AMERICAN MACHINE IN ENGLAND.

The so-called "Grahame-White Baby" biplane attracted considerable attention at the recent British show on account of its flying at Hendon in the hands of Grahame-White, Greswell and Martin.

English journals seem to forget that the so-called "Grahame-White Baby" is an American product—or, perhaps, Mr. White did not make it a point to inform. This is the machine that J. V. Martin, late of the Harvard Aeronautical Society, has been flying as one of White's aviators. It was built—seven of them—by the Burgess Company and Curtis, of Marblehead, out of American material. Goodyear fabric and tires are used, and the Burgess Company's "gate control," allowing either hand to be used, is standard, though White has changed the latter to a one-lever control. English "Aero" mentions the machine as follows:

"The machine is, in a general way, a miniature Farman, but the lower plane is much closer to the ground, and consequently, in order to get the necessary height above the ground for the propeller, the engine is raised till the center of propeller thrust comes almost midway between the main planes. This is a distinctly good feature in the design, as the center of thrust comes very much nearer the center of resistance than usual, and consequently when the engine is switched off the machine has more tendency to travel in a straight line.

"A biplane tail, much of the ordinary Farman type, is used, and elevator flaps are fitted behind the tail, which are coupled to the front elevator. Ailerons are fitted to both the upper and lower planes, and the planes are made easily detachable so that the outer sections of the wings can be taken off, leaving the machine the width of its own chassis only. As in the Farman, a lever controls the elevator and ailerons, and the steering is effected by a foot lever. A 50-h.p. Gnome engine is fitted.

"A peculiarity of the machine is that on the top of the front edge of the upper plane, at each end, is a little flap working on a hinge and coupled to the ailerons on the opposite wing, so that when the ailerons are pulled down on one side, so tending to lift the machine, the flap is pulled up on the other side, thus tending to depress that side, the idea being that not only is one wing lifted and the other depressed, so giving quicker lateral control, but extra resistance is given by the raised flap, so counteracting the tendency of the machine to swing round in the direction of the side on which the ailerons have been pulled down.

"The finish of the whole machine is very neat and taking to the eye."

AT BELMONT PARK.

The sheds erected for the international meet are rapidly being filled with builders and students.

W. Diefenbach and Henry Bachard, of 178 E. Eighty-fifth street, New York, have a well-built Farman-type ready for the motor, which is to be one of the new 6-cylinder Kirkhams. It spreads 38 ft. The tail is a single plane, adjustable angle.

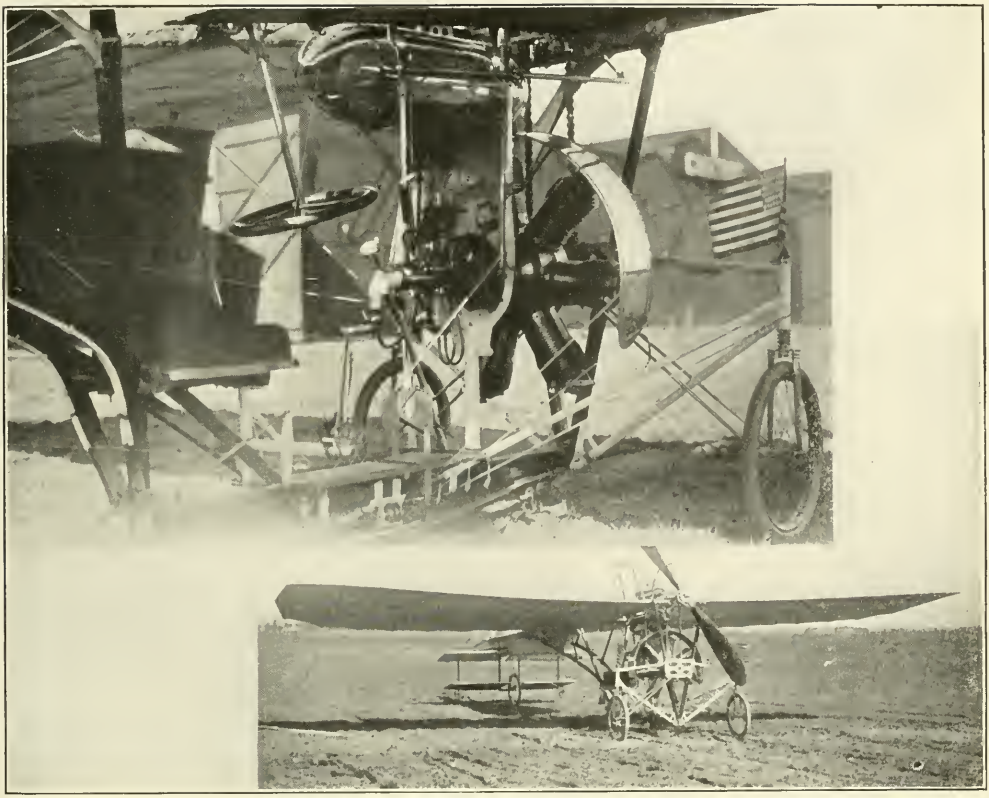
John H. Davis, 25 Broad street, New York, has a monoplane with novel ailerons. This is equipped with a Hall-Scott motor, for which he is agent.

Dr. Wm. Greene has a light Farman-type, without engine.

M. P. Talmage's (Garden City, N. Y.) Curtiss-type has been making some flights. This is fitted out with an 8-cylinder Rosenberger engine, Gibson propeller, El Arco radiator and Bosch ignition.

Fred. Shneider, 1020 E. 178th street, New York, has six pupils on the grounds. Some short flights have been made, but the ground is very soft and the fences have been put up so that flying is restricted. The school machine is a Curtiss-type, with Farman-type of running gear and skids. The engine is an Elbridge, El Arco radiator, Bosch ignition, Hartford tires. A Curtiss-type with Elbridge engine has been sold by Shneider to Tony Castellane, of Brooklyn. A big Farman-type is to be delivered to G. F. Laser, a New York man. This will have a 100-h.p. Emerson.

Earle L. Ovington, Queens, L. I., who returned three weeks ago from Europe with a pilot's license in his pocket, has a new 70 Gnome Bleriot. This is a beautiful piece of work. A revolution counter is convenient for the sight of the pilot, as well as a map case which rolls the map along as territory is covered. There are the usual pressure gages. The fixed tail is concave on the upper



International Aero Construction Co. Mono. *Photo by Edwin Levick*

side, one notices, and the extra pair of racing wings has a slight inverse curve at the rear.

Romaine Berger, 63 S. Franklin St., Hempstead, N. Y., has two monoplane frames assembled. These resemble fairly closely the Bleriot. In two weeks he promises to have one machine complete, with a wonderful new nine-cylinder rotary 125-horsepower engine of his own design. This will have Mea ignition and a Harris-Gassner propeller.

The International Aero Construction Co. of Woodhaven, N. Y., have a fine looking monoplane. As will be noted in the illustration, the 50 Gnome engine drives by chain from its position under the wings.

Saliger and Kerrigan have a following surface machine with a 100-horsepower Emerson engine, which has failed to fly thus far.

W. R. Kimball will have a biplane with four chain-driven propellers in one of the sheds before the end of April.

A Wright machine is due about June 1 for school purposes.

NEW KIMBALL BIPLANE.

W. R. Kimball is putting the finishing touches on a new biplane along the lines of his New York No. 1 (AERONAUTICS, Jan., 1909); in fact, it will be called New York No. 2.

Like its predecessor, it is a tailless machine, differing mainly in the use of two propellers instead of eight and a chain drive instead of wire rope transmission. The chain drive is accomplished, however, by gearing to a 6-inch counter shaft, thus making it unnecessary to cross one chain.

The novel rudders at each end of the main planes give somewhat the appearance of the new Voisin tailless. This disposition of the steering mechanism has a tendency to restrict skidding in making turns.

Fore and aft equilibrium is maintained by a fixed horizontal surface 16 feet in advance of the main planes, and an elevator of the same size 3 feet further front.

The trussing is all done with steel rods, none smaller than $\frac{1}{8}$-inch diam., and the whole construction although this is overlooked because of the generally rounded shapes of the corners, the double covered surfaces and general appearance gives the impression of massiveness of extremely small head resistance. Four large ailerons of the Farman type indicate a provision for flying at low speed, and the big surfaces, 40x6 ft. 1 in., promise big passenger carrying capacity, although a 4-cylinder automobile-type motor only 4x4 in. is installed for use on the first try-out, with two Gibson propellers 8 ft. diam., 8-ft. pitch.

Long skids and Farman running gear make up the chassis, in which sheet steel joints and trusses is a noticeable feature. In the specially shaped ailerons is noticed a provision for the installation of two additional propellers as a part of an extended series of experiments to be tried out as to efficiency of planes and propellers under varying conditions of practice.

The aeroplane not only presents a unique appearance at a distance, but closer inspection shows a number of innovations in construction details, the most noticeable, perhaps, being in the joining of all stay wires at the center of each panel by spoke nipples in a steel ring,

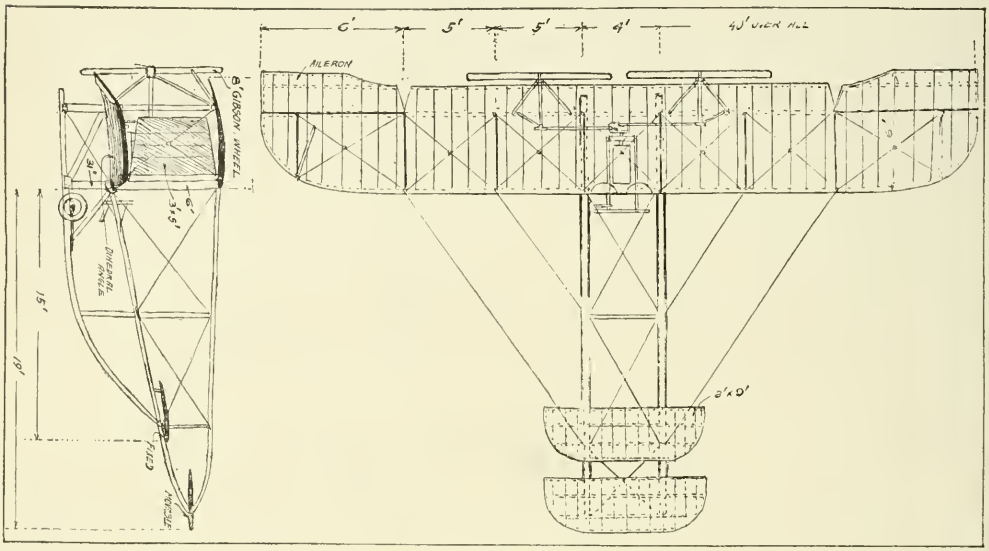
making the tightening system of easier access than at the corners, as generally used.

A fixed ignition Bosch magneto leaves only one control, the throttle lever, necessary for the engine.

The steering is done with the feet and the front control and the ailerons worked with one hand leaves the other free.

The machine unmounted, with fuel and water, weighs 950 pounds.

Philip W. Wilcox, the Columbia student who made several short flights in a Farman-type machine of his own design, last summer, at Mineola, will be connected with the Moisant company.



Kimball Tailless Biplane.

"FREAK" AEROPLANE FLIES.

The unique biplane, or monoplane, whichever suits best, built by Wm. P. Gary, of Paterson, N. J., made its first and last flight on April 9. Mr. Gary resents its being classed as a "freak," and perhaps one doesn't blame him. The locomotive was once a freak, along with the telephone.

However, Mr. Gary reports great confidence in his second machine, now building.

The machine flew about a hundred yards, when the axle and a wheel broke, with the Harriman 50-h.p. engine and Paragon propelier going at full speed. Not having skids, the aeroplane buried its nose in the ground. The engine is centered 9 feet above the ground and registered 400 lbs. pull at 990 r.p.m. The weight carried was 900 lbs. No ribs were used, as the tautness of the end wires on the rims of the circle regulated the curvature. This was found unsatisfactory, and the new one will be better built anatomically. Good luck to Mr. Gary.

Gary's object is to secure good stability by the style of construction.

MOISANT SCHOOL TO OPEN.

The Moisant Aviation School is expected to open on Long Island about May 1st, under the management of A. J. Moisant, with two competent and qualified pilots in charge as instructors.

One of the instructors will be Andre Houpert, a pilot from Bleriot's Pau School. He obtained his licence last February. Both will be French pilots of monoplanes. A French constructor is also on his way here to take charge of the building of the Moisant School machines which will be of the Bleriot-type, with Anzani engines.

Mr. Moisant has been developing for some time his "Moisant Junior" all-steel monoplane, which will be equipped with 50 or 70-h.p. Gnome motors. Trials of the machine are being made in private, and no information will be available until results prove satisfactory to Mr. Moisant. Garros and Audemars have taken two of these machines with them abroad and will try for places on the French Gordon Bennett team, as well as take part in other events. They will return to America about July 15th and take part in a meet to be held in Chicago.

ALUMINUM BIPLANE.

Edward Wilson, of Joplin, Mo., has been making flights in a Curtiss-type biplane designed by E. M. DeChenne, of the DeChenne Aeroplane Co., Monett, Mo.

A feature of the machine is the use of aluminum for the framework, and the builder is even thinking of using sheet aluminum instead of cloth for covering the planes. In this instance it is claimed that aluminum has the advantage over wood in that it "does not break from the shock. It can be bent almost double and straightened out again as good as ever, several different times if necessary. It is really lighter for the same amount of strength, also." The machine actually fell from a height of about 50 feet without doing very much damage. When the aviator is more proficient, it is intended for him to make exhibition flights. The motor in the machine is a DeChenne. Outside of the strut sockets, which are cast aluminum, and the aluminum struts and other parts of the framework, the machine follows in general style the well-known Curtiss with the inevitable El Arco radiator.

Henry M. Neely, Betz Bldg., Philadelphia, will continue this year his lecture work which met with such splendid success in 1910. Mr. Neely is a well-known figure in aeronautics, and, besides being one of the founders of the Aero Club of Pennsylvania, has been active in various aeronautical organizations. "Aeroplanes —Why and How They Fly," is the title of one of his talks. In simple language, the principles of flight are explained and the operation of aeroplanes shown by working models. "The Airship in Peace and War" is a supplementary lecture. Both are illustrated with lantern slides and moving pictures.

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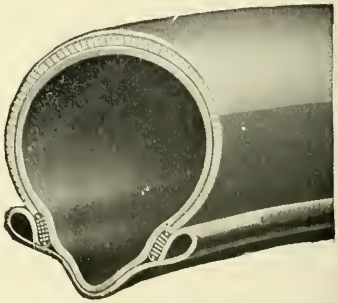
Judge the Goodyear by the fact that these aviators have equipped their own machines with it: Brookins, Parmelee, Grahame-White, Garros, Glenn Curtiss, Hilliard, Capt. Thos. Baldwin, J. A. D. McCurdy, Charles J. Hamilton, Harkness, and scores of other famous American and foreign aviators.

Goodyear Rubberized Aeroplane Fabrics are used by The Wright Co., Burgess Company & Curtis, The Curtis Aeroplane Co., and practically all American manufacturers. These pioneers know what is best.



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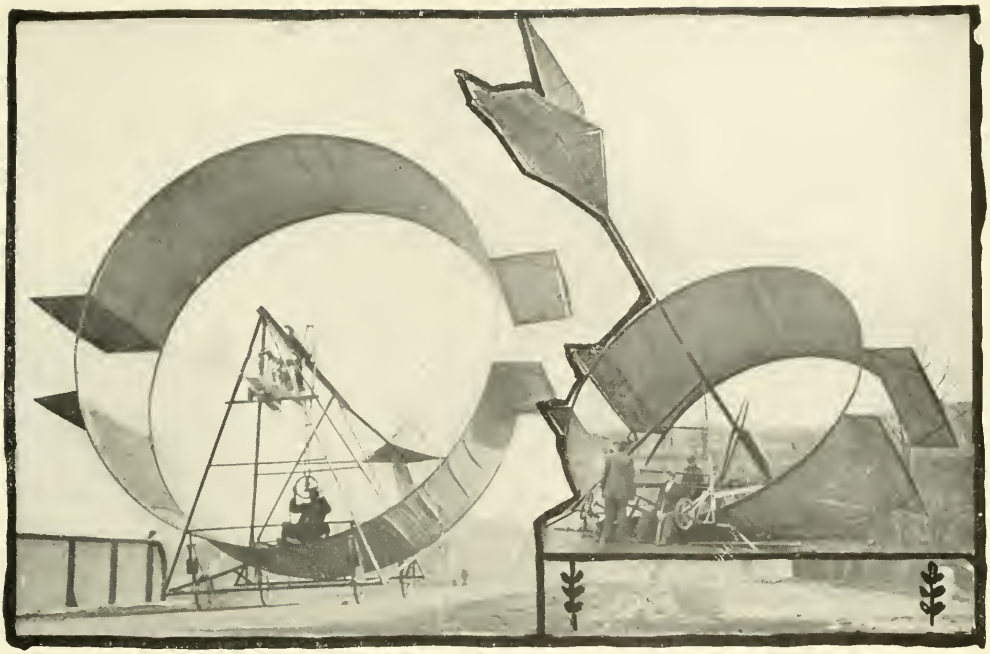


The Gary Flyer—Before and After.

CLEVELAND METAL MONOPLANE.

The Burgess-Wiseman Mfg. Co., Cleveland, O., is to put out a monoplane, designed and built by E. H. Wiseman on somewhat different lines than the present monoplanes, and enjoys the distinction of being the first Cleveland machine to make a successful flight. However, since that flight, which occurred shortly before Curtiss made his flight to Cedar Point and return, Mr. Wiseman, desirous of building a more improved machine, upon which he had been working for some time, became associated with R. C. Burgess, who furnished the capital necessary for the completion of the present machine and formation of the company, which is incorporated for $10,000.

Wiseman is a thorough mechanic, having constructed the entire machine, including the motor, and, considering the success he attained with his former machine, which might be described as crude compared with the present machine, the company has no fear for the complete success of it.

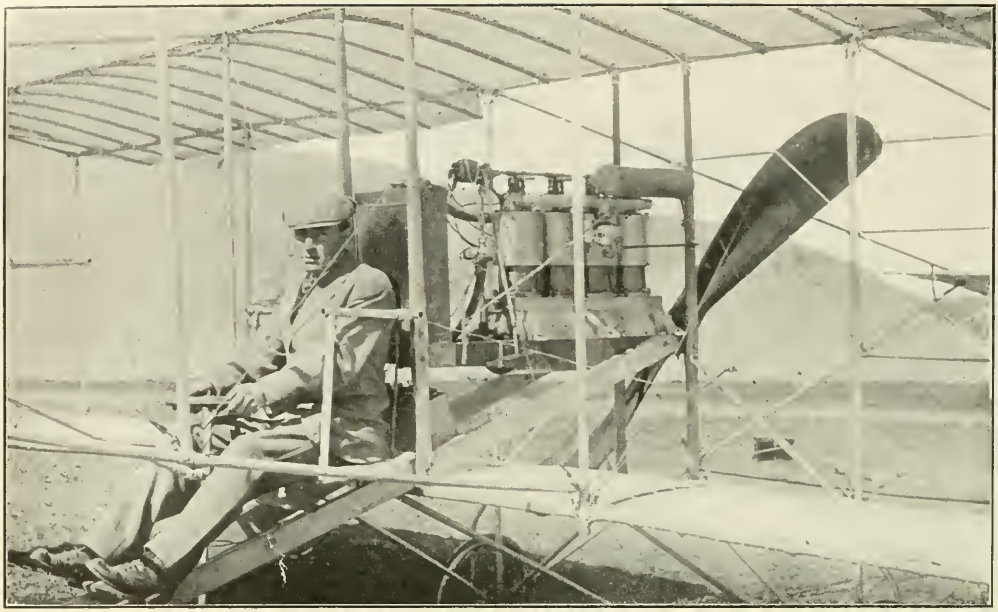
The main plane measures 26 by 6 ft., not including space out for fuselage, covered with Goodyear fabric. Elevator 3 by 6 ft.; rudder 2 by 3 ft. The lateral beams are of 1¼-inch No. 18 steel tubing. The ribs are of basswood 1⅞ in. by ½ in. by 6 ft.

The motor, 4-cylinder, double opposed, 25 h.p., A. L. A. M. rating, 2-throw crank, steel cylinders 4x4, copper jackets, automatic intake, weighs stripped 90 lbs. Ignition by magneto, Shebler carburetor.

DETROIT SEES NOVICE FLIGHT.

Detroit, Mich., has been backward in the way of flying machines, so the flight of Donald Gregory, 19 years old, of 803 Spring St., Michigan City, Ind., was a novelty in that city.

The Burgess-Wiseman Machine.



Ed. Wilson in DeChenne Aluminum Machine.

Just previous to the flight, young Gregory had done a little "grass cutting," and then arose for a rather extended flight. He made a circle of the Athletic Field, which is about a mile in circumference, at a height of about 40 to 50 feet, and then attempted to rise. Apparently the plane rose faster than the aviator had anticipated, and to check himself he threw the elevator down too hard and simply dropped. The Detroit Aeronautic Construction Co. motor was running when he struck the ground. The biplane is a wreck, but neither the aviator nor the engine were injured.

The engine is placed in front, as in a monoplane, the elevator being in the rear.

The manufacturers of the engine have sold another one for use in Japan.

BALLOONIST BUILDING NOVEL 'PLANE.

Jos. A. Blondin, well known in the history of American aerostation, who is now living at 3209 S. Main street, Los Angeles, Cal., has an aeroplane well along. He has incorporated into it several novel features. The machine rests on skids and lands on skids. In starting, it is possible by moving a lever to push down the wheels, with which the machine is also equipped, into contact with the ground. The aviator's seat is capable of swinging from side to side as the machine tilts, automatically operating the ailerons.

To avoid any turning movement of the aeroplane which may be caused by operating the ailerons, due to unequal pressure on either aileron, a system of differential gearing has been devised so that the resistance of either aileron will be exactly the same as the other, irrespective of whether both have or have not the same angles of incidence, negative and positive. It is reported that there are several applications in the Patent Office covering this same point.

It will be remembered that one point in the Wright-Curtiss injunction case was that of one aileron alleged to have a different angle with respect to the line of flight than the other, claimed to result in a turning of the aeroplane as a whole, to be corrected by the vertical rudder.

IN INDIANA AND OHIO.

At Muncie a party by the name of Frazier Warner is building a monoplane of the Bleriot type; also manufacturing propellers on a small scale. Clarence Boomer is building a monoplane of the Bleriot style also, and Arthur Humfeld is constructing a biplane.

I spent a morning at the Wright factory and the afternoon at their training ground, where Walter Brookins was instructing Lieut. Rodgers how to fly. Some very pretty flights were made in a 20-30-mile wind, and every day the weather permits they instruct one or more prospective aviators.

At Cincinnati Chas. Ambrose has constructed a lightweight monoplane of original design, fitting it with an 8-cylinder, water-cooled motor that he built himself. A Mr. Schillinger, of the Schillinger Hardware Co., at 8th and Main streets, has built a biplane and is now ready to equip it with two motors and two propellers, although I was unable to secure definite information on its construction.

There is much activity in the aero motor building department of the Dean Mfg. Co., makers of the Fox motor, and they seem to be very enthusiastic over their product.

R. O. RUBEL, JR.

New Aeroplane Engine.

A new two-cycle aeroplane engine has been put on the market by H. J. Leighton of Syracuse, a well-known builder of engines for racing boats. It is unique as far as aeroplane engines are concerned, in that it has as much bearing surface on the crank shaft as is found in most marine motors. The weight of the entire engine is guaranteed to be not over 260 pounds, and the horsepower not under 50—practically 1 horsepower to every five pounds of weight. The motor works on the two-cycle, three-port system, and is of remarkably compact construction.

The Motors Engineering and Sales Co. is the metropolitan distributer, and this company has a motor on exhibition in its showroom at 250 W. 54th St., New York City.

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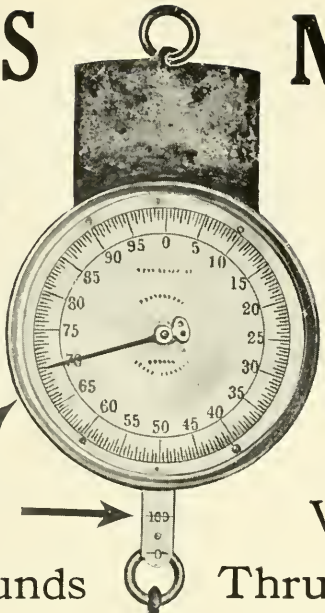

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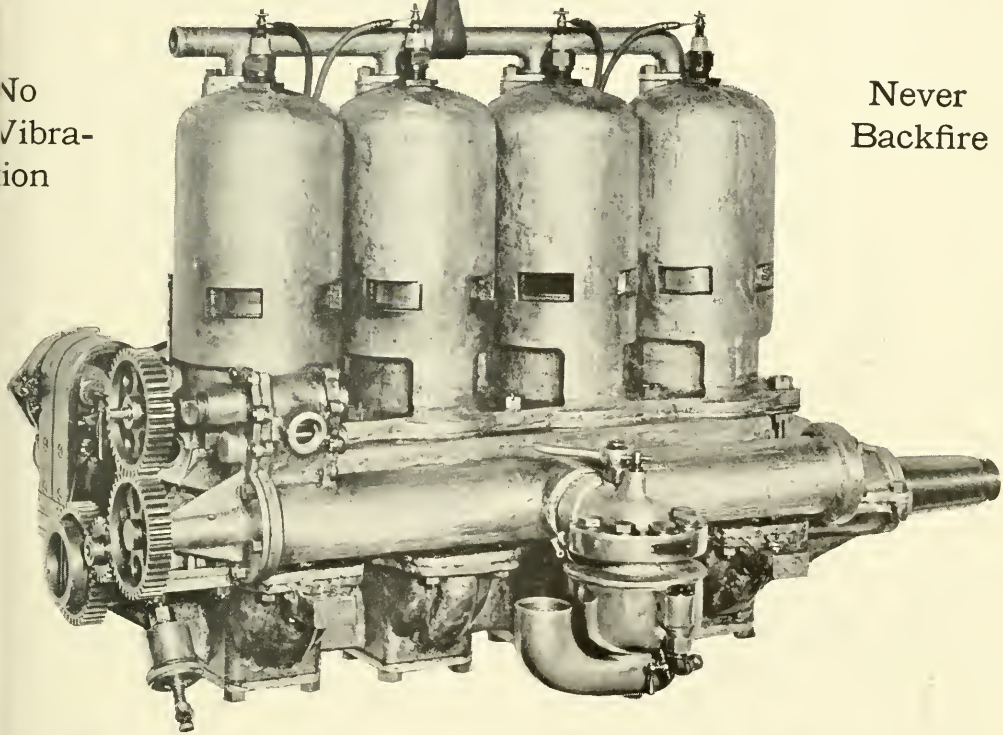

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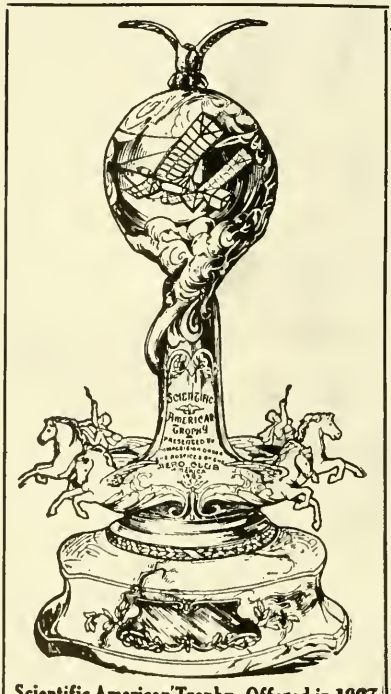

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NOVICES IN SAN FRANCISCO

Two Views (1 and 2) of the Meyerhoffer Machine. No. 3 Is the Fortney.

THE MEYERHOFFER TRIPLANE.

By Cleve T. Shaffer.

THIS interesting and beautifully made machine has been miscalled a biplane, a following plane and a multiplane; but while it is a combination of the above, the correct appellation should be "triplane." The design has a suggestion of the Goupy in the placing of the upper plane forward and of the Montgomery glider in the placing of the upper planes one behind the other in the line of flight.

The spread is 32 ft. by 33 ft. fore and aft. Two planes, 5-ft. chord, placed one behind the other a distance of 4 ft., are superimposed 5 ft. over a similar plane set below and between the upper surfaces; a side view gives the appearance of a "V" with a plane at each point.

The upper rear surface is set at an agle of incidence considerably greater than the front and the lower plane (due to the downwardly moving and disturbed air from the front plane which it so closely follows). While an almost equal lift is thus obtained, the drag necessarily calls for a greater expenditure of horsepower. Mr. Meyerhoffer, the designer and operator, claims, however, that the greater stability obtained by the use of a following plane more than compensates for the additional propeller thrust required. The following plane incorporates several other unique ideas with a view to stability. For instance, the center section of the upper rear plane has been left entirely open over the propeller and extends 2 ft. further laterally on each side than the front and lower planes. There is also a raise toward the center, or open space, giving the two sections a slightly inverted dihedral angle. This would seem to lessen the lifting efficiency of this plane to a small extent.

Ailerons, 2 ft. x 6 ft., pivoted to the front vertical struts on either side, are operated in a novel manner. A belt which buckles around the operator under the arms takes the place of the familiar shoulder fork.

A slight flattening of the planes on the outer sections is noticeable. Camber in center sections 3¾ in. in end sections 3¼ in. This idea, while not a new one, has been adopted by few. It would seem to give some small amount of natural stability.

The planes are single surfaced, of Naiad cloth, tacked to the under side of the ribs and to front beam, laced to section ribs, and at the rear to a wire passing through ferrules in the ends of the ribs. An efficient drumhead-tightness of surface results. Ribs are laminated of clear spruce, "Camasco" made. The section ribs, 4-ply, ¾ x ¾ in.; center section, 5-ply, ¾ x 1¼; intermediate, 3-ply, 9-16 x 9-16 in. Ribs attach to front beam by flattened steel ferrules and to under side of rear beam by suitable clamps. Beams are 1 x 2¾ in., clear spruce, of a special stream line form. Center section beams are laminated, 2-ply, of slightly larger size. Struts are of stream line form. Strut connections, "Camasco" design, are of steel, no aluminum sockets whatever being used. This follows the latest practice. While but slightly heavier (?) than aluminum, or alloy castings, they are far superior in strength, have little head resistance, are neat, mechanical and allow of quick assembling and disassembling by a very slight loosening of the guy wires; and furthermore, it is impossible for the struts to work loose or drop out.

Nickel steel eyebolts are used. In the upper beams the eyebolts receive the upper ends of guy wires, while all turnbuckles are below and easily accessible, being directly connected to the lower strut connections by a short steel strip which holds one of the turnbuckle eyes. Roebling stranded steel "Aviator" cable is used throughout; there being no wiring, however, in the center section, which is braced by 16 ga. steel tubing diagonally to the oak engine bearers. This is a very good feature.

Three 20-in. "Camasco" wide-hub wheels support the machine, without any type of shock absorbers. A 6-cyl. 90-h.p. Eldbridge engine drives direct an 8-ft. x 6-ft. pitch propeller.

El Arco radiator. Thrust, 420 lbs. Brakes are fitted on both front and rear wheels. The elevator, rudder and ailerons work as in the Curtiss.

Mr. Meyerhoffer has made a number of flights in this machine in which almost no attention was paid the lateral balance. The machine was built in the California Aero Mfg. & Supply Co. shops under the designer's directions.

SHEAF & DE BERRI BIPLANE.

A Farman-type machine that managed to clear "Calamity Gulch" and almost make the half mile was a novelty, but it met with the usual fate upon landing.

Spread 30 ft., fore and aft 36 ft., chord 5 ft. 6 in., camber 3½ in., "Camasco" ribs. Single front elevator 3 ft. x 7 ft. Tail, skids and wheels are usual Farman type. A small castor wheel supports tail, tubing diagonal; skid struts are used instead of wood.

Farman flaps operated by Curtiss-type control. Weight 900 lbs.

Mr. Geo. Loose, who flew the machine, claims it was out of balance longitudinally, being heavy in front. It made a creditable flight, however, considering that the engine was giving trouble.

Power Plant: a 4-cylinder, 5 x 6, 60-h.p., McDermott motor, weighing 325 lbs., drives direct an 8-ft. dia., 6-ft. pitch propeller. Thrust (stated) 500 lbs., at 1,200 r. p. m. An aluminum tube radiator of novel construction weighing 19 lbs. was fitted.

KEARNS BIPLANE.

This Curtiss-type machine of very crude construction made several short flights over "Calamity Gulch," but collapsed each time upon landing, the last flight wrecking it beyond immediate repair. General dimensions are similar to the Curtiss except the chassis wheels. Weight (stated) about 425 lbs. An Elbridge 40-60-h.p. motor drives direct a Requa-Gibson propeller, 6-ft. diameter and 4½-ft. pitch.

FORTNEY MONOPLANE.

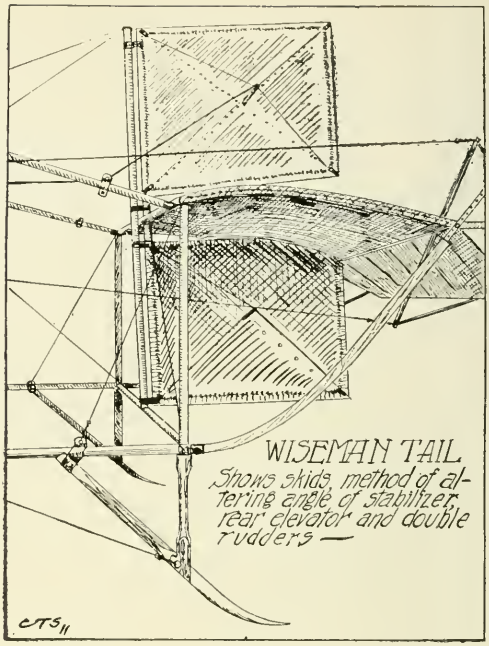
This large monoplane, viewed from a distance, had a very fine appearance, but close inspection showed a number of weak points in construction. Spread 46 ft., fore and aft 33 ft., total surface 300 sq. ft. Planes double covered, 8-ft. chord in center, sloping to 5 ft. on ends. Camber about 6 in. Fuselage entirely covered by cloth, main longitudinal members are encircled at proper distances by bicycle rims, upon which are nailed thin wooden strips to which the light cloth covering is tacked. At the rear, vertical and horizontal fins end with double rudders and elevators.

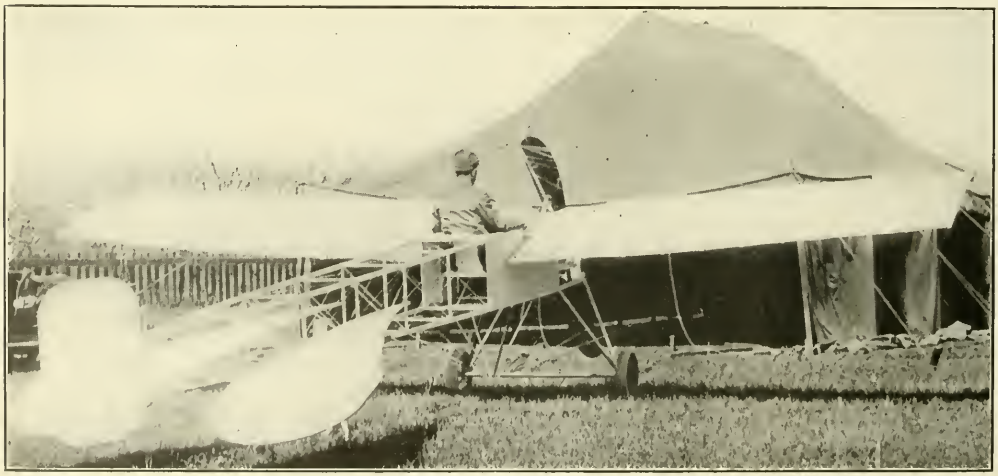
Aileron flaps are attached to rear ends of planes. The running gear was apparently too light and not well enough braced for such a large machine. In general design it was similar to one of the earlier Antoinette models, the planes having supplementary supports in this case, a wheel at the end of a tube placed vertically through the center of each plane.

A short skid carries the usual single main supporting mast. Two 20-in. wheels pivoted on either side work through a sliding collar against a spring encircling the mast. A wheel is also placed under aviator's seat, while a skid supports the tail. Weight (stated) 850 lbs.

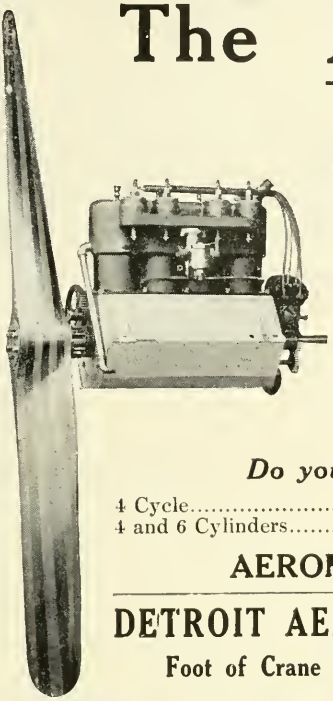
Power Plant: a 4-cylinder, 5 x 5, 60-h.p. Knox automobile engine, weighing 400 lbs., drives direct an 8-ft. diameter, 4-ft. propeller.

This machine after two short jumps met with the usual fate of the novices. Louis Fortney, the builder, deserves credit for staying in the game, as this is his third machine to be destroyed.





Johnson Monoplane



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JOHNSON MONOPLANE.

The Bleriot type machine of Johnson Bros., Sunnyvale, Cal., has some interesting and novel features. Equilibrium is obtained by a unique system, the basis of which is a variable camber; for instance, on the side that is down, the camber is increased, and vice versa. Another novel feature of this Bleriot type machine is the landing gear, where, instead of the large swivel wheels usual in a Bleriot, the frame is supported by two rigid wheels with no shock absorbers. The large tires, however, make landing easy. Pennsylvania tires are 20 by 4 and Goodyear cloth is used throughout. An Anzani 25-30-horsepower engine drives direct a Requa-Gibson propeller 6 ft. 10 in. diameter, 2 ft. 9 in. pitch, obtaining 200 pounds thrust, which is claimed is sufficient for flight. Total surface 180 ft. Weight 460 pounds. Mr. Johnson reports that he has made several short flights up to 600 ft. The machine is of neat workmanship.

Each plane (spread 30 ft. fore and aft, 27 ft.) has the regular two parallel wing bars or beams 14 ft. long, fitted into sockets on the fuselage and held in place by the usual stay wires. To these beams the ribs are suitably fastened, being made of laminated spruce, the first five on each side nearest the fuselage have a fixed curve of 1 in 20, while the outer ribs are flexible, and by the inward movement of a wire, between the beams, connected to bow wires fastened to each end of these flexible ribs, the camber is increased. The outer ribs on the other plane being simultaneously flattened. The center or warping wires are suitably connected to the control wheel.

The idea is that when the machine is flying to increase curvature of wing on the low side, thereby increasing the lift, at the same time the other wing is made flatter, correspondingly decreasing its lift and thus bringing the machine to equilibrium. It is said that the most noteworthy effect gained so far is that the machine is not deflected from its course by the curve variations, it being unnecessary to use the rudder in keeping a straight course.

The principle seems a good one, and further results will be eagerly awaited.

BREWER BROS. BIPLANE.

Composite type machine, slightly suggestive of the Farman. Spread lower plane, 30 feet; upper 35 feet. Fore and aft 33 feet, chord 6 ft. with a 4½ in. camber. Ribs of novel construction very strong and light; consists of a thin upright piece sawed out to the proper rib shape, which have two small half rounds glued on top and bottom, the half round having a groove which fits over the upright piece.

Rear beam is placed underneath. Skids wih two sets of 24-in. Farman-type wheels are hung by steel and rubber springs. A small 20-in. wheel is set in front, as in the Voisin, to prevent a too steep landing.

A rather unique system of truss work is used under and over the center section, which construction seems unnecessary. The head resistance of the chassis is increased, but, of course, so is the factor of safety.

The joining of the diagonal skid struts with the upright should be at the skid instead of above it, to take care of sidewise landings.

Ailerons pivoted to front struts are operated by a wooden shoulder fork. Steering wheel controls double front elevator, by a push rod, and rudder by turning.

A thrust of 240 pounds by a 40-h.p. Rutenber automobile motor weighing 350 pounds was unable to raise machine. Propeller 6 ft. 6 in. diameter, 5-ft. pitch, 1,200 r. p. m. Bosch magneto, Schebler carburetor. Cooling by a 3-gal. radiator weighing 18 pounds, made of 32-ga. copper tubing. Weight of machine (stated) 675 pounds.

WHEELER MONOPLANE.

Bleriot type with fan tail. Spread 32 ft., by 24 ft. fore and aft, chord 6 ft. 6 in., camber 5½ in., 1-3 back from front edge.

This machine, of very neat construction, was under-powered and unable to attain sufficient speed for flight.

Planes are double covered, have three wing bars which fit into tubing sockets in the fuselage. Thickness of planes 6 in. in center. Two 20-in. wheels are used instead of the 28-in. usual in the Bleriot. Skid in rear.

The two main uprights are of 1 15-16 ash round. A mast is placed underneath the fuselage, but is brought almost too near the ground by the small wheels used. The rear controls appear a bit heavy. A single semi-circular elevator is operated by the movement of a steering wheel fore and aft. Turning wheel operates ailerons.

Weight 700 pounds. Power plant: a Franklin 26-h.p. automobile motor drives direct a 7-ft. diameter, 4-ft. pitch propeller at 900 r. p. m. Thrust 250 pounds.

GISELMAN BIPLANE.

The construction and general details are practically similar to the Brewer Bros. machine, with the exception that the ailerons are pivoted diagonally to the line of flight. Weight (stated) 800 pounds.

The power plant consists of a 40-h.p. Pope Toledo automobile engine, weighing 300 pounds, driving direct a 7-ft. propeller with a 5-ft. pitch. After several short flights across "Calamity Gulch," the machine was converted into kindling wood upon landing.

FACTS ABOUT SOARING

(*Continued from page 155.*)

‡The name turkey buzzard is sometimes incorrectly applied to all vultures of the southeastern states.

Victor Longheed is responsible for the statement that in California he has seen a condor start from a fence post and soar over the mountains without the stroke of a wing, when no rising current was perceptible. To my mind these observations prove that a force like gravity can act on a body like a bird in such a manner as to make it rise against the force. Just as a force, the wind acts on a body, the sail boat which in turn moves against the force. In fact, I think we are deeply indebted to Prof. Montgomery for the twenty years of labor and study applied to solving the ages—old problem of human flight in a way that will rival even the condor and the albatross. Experiments are now being recommended by Prof. Montgomery in California and it is to be hoped that he will soon be able to accomplish the long-looked-for soaring flight.

I have also been making some experiments at Daytona Beach, Florida, with a Montgomery glider. The picture shows the glider in the course of a two mile flight which was accomplished by towing the machine behind an automobile. When the tow rope was slackened during the flight the machine would begin to glide at a very flat angle. With this fact in view I had intended to tow the machine into the air, then release the tow rope and glide to the earth, but owing to an accident in which the machine was smashed and my foot hurt, I did not get an opportunity to try this out. In closing I wish to warn other experimenters to profit by my experience and avoid all forms of towing flight. I have found this to be dangerous. A machine which if free would be perfectly safe is made as erratic as a child's kite by the attachment of a rope. I, for one, shall seek other means of getting into the air.

Garros Flying Over Vera Cruz.

EXHIBITION FLYING AND MEETS

SWAIN CIRCUIT.—The W. I. Swain Show Co., of New Orleans, started out the end of March with Walter Johnson, flying the Thomas headless biplane; William Evans, to fly the Swain Farman, and J. J. De Praslin, of St. Louis, a novice, under the name "National Aviators." They started at Morgan City, La. (with a two-day meet scheduled at each place), where there was a big crowd the first day and no one the second. Johnson only one to attempt flight in strong wind; smashed. The local committee cancelled the second day at Houma and New Iberia. Lafayette was a "frost," as the aviators had trouble with Swain, and no flying was done. Lake Charles and Crowley cancelled flights. Evans could not do anything with Swain's Farman, and the Johnson machine was the only one to fly, with bad grounds, muddy fields and rains.

The aviators left Swain and started to fly in the small towns. Johnson flew his machine successfully at Lake Charles and Crowley. At Crowley, on April 17, made some very good flights. William T. Thomas left on this day for Natchez, Miss., to arrange for flights there.

HAVANA, Cuba, March 22-27.—The Moisant Aviators flew for the new Aero Club of Cuba. Henry A. W. Wood represented the A. C. A. at the flying, as it was thought a new altitude record might be made.

Mr. Wood furnished valuable information in behalf of the running of the meet, also how official records were to be taken for altitude, duration and speed; and drafted a set of forms for them for that purpose, which proved very valuable. Wonderful flying was done by Garros, Simon, Barrier and Audemars. St. Croix Johnstone made a remarkable flight over the city, dropping two oranges at Morro Castle at the height of about 2,000 feet, one fell in the harbor and the other hit in the Castle yard. The flight was about 41 minutes, covering about 38 miles. His highest altitude was supposed to have been about 3,000 feet; he used a Bleriot with a 50-h.p. Gnome. The attendance was fair and greatly appreciated the flying.

Cuban records were created for altitude (Garros, 6,818 feet) and for duration (Simon, 50 feet 36 inches).

Barrier flew from the grounds out to Morro Castle and back, repeating the McCurdy flight, the prize of $3,000 having been extended. Barrier beat McCurdy's time and claimed the prize. It was later definitely awarded McCurdy, as the A. C. of Cuba realized it had no right to extend the time limit after it had been flown for.

PINEHURST, N. C., March 30-April 5.—Lincoln Beachey (Curtiss) finished up the tuition of Roland G. Middleton, who has been learning to fly the 4-cylinder machine. Commander Shichigora Saito, of the Japanese Navy, was one of Ely's passengers. During this week Beachey spent 18 hours in the air in seven days.

DAYTONA, Fla., March 28-30.—McCurdy (Curtiss) flew.

ST. AUGUSTINE, Fla., April 2.—McCurdy and Ward flew.

GREENSBORO, N. C., April 7-8.—Beachey flew.

FAYETTEVILLE, N. C., April 9.—Beachey made flights.

KNOXVILLE, Tenn., April 12-13.—McCurdy and Beachey filled this date.

SAN DIEGO, Cal., April 2.—H. A. Robinson, Curtiss aviator, gave a bomb dropping exhibition with California oranges. Lieut. Ellyson and C. C. Wittmer, another new Curtiss aviator, did some grass-cutting.

RAPID CITY, S. D., April 10-12.—H. A. Robinson flew here. Weather prevented very successful flights. Additional surface had to be added to the plane.

PUEBLO, Colo., April 17-19.—Moisant Aviators flew. From here they come East, flying at towns along the way.

SAN BERNARDINO, Cal., March 26.—Willard and Robinson made four flights each before 10,000 people.

PASADENA, Cal., March 29-30.—Willard and Ely made exhibition flights.

SALT LAKE CITY, April 6-10.—Brookins, Parmalee, Ely, Curtiss and Willard flew. All made fine flights, reaching altitudes above the ground up to 4,000 feet, and flying over the Great Salt Lake and above the smelters. Curtiss flew his water machine, but had difficulty in getting up, due to the great percentage of salt in the water and the high altitude of the lake, 4,300 feet. Ely got up to 8,300 feet above sea level, or 4,000 feet above the lake. Brooktional flying in windy weather. Barrier flew over the city. The bird-like flights for which ins and Parmalee's bomb dropping exhibitions and glides were sensational.

HUTCHINSON, Kans., April 13-15.—Moisant Aviators, Simon and Barrier, provided sensa-

PAGE SIXTEEN THE SAN DIEGO UNION, THURSDAY MORNING, MARCH 2, 1911.

ARMY OFFICERS SAY CURTISS MACHINE IS SUPERIOR TO WRIGHTS'

Passenger Carrying Tests Demonstrate Efficiency to Military Representatives.

STUDENT MAKES FLIGHT

Lieut. John C. Walker, Jr., Pilots Aeroplane Over North Island Course.

Two flights made by Glenn H Curtiss at the army and navy aviation school on North Island yesterday proved the passenger-carrying qualities of the Curtiss biplane to military and naval representatives.

The first passenger to ride with the birdman yesterday was Lieut John C Walker, Jr of the Eighth infantry A passenger's seat was attached to the lower plane to the left of the pilot's seat This was occupied by Lieutenant Walker and with Curtiss at the wheel the biplane soared to a height of 600 feet, making an easy and graceful flight around the island and demonstrating its adaptability for work which the government has proposed for aircraft

Lieut G E M Kelly of the Thirteenth infantry was the next passenger taken aloft by Curtiss, and the machine again demonstrated its efficiency in carrying passengers According to Lieutenant Walker the trips made yesterday proved the superiority of the Curtiss machine over the Wright aircraft for carrying passengers. The officers were well pleased with the flights The machine, despite its load of 300 pounds, the weight of Curtiss and the passenger was easily handled as it is when only the aviator is seated in the craft

During the flights it was learned that the Curtiss biplane when carrying a passenger is faster than the Wright machine and a similar import, and this fact was noted by the army officers After Curtiss had finished his flights with the lieutenants, the practice machine which was disabled a few days ago by the breaking of a crank shaft was put into commission and manned by Lieutenant Walker.

The lieutenant made a short flight over the island course and handled the machine with much skill considering the experience he has had in aviation The flight made by Walker was pronounced by Curtiss to be the best made by any of the student aviators since the school was established at North Island

LOHMAN ENTERS UPON DUTIES AS PATROLMAN

STEAMER YALE EXPECTED TO BRING 1000 ON FIRST VO[YAGE]

Pacific Navigation Company's palatial steamer Yale, which is scheduled Harbor Saturday afternoon at 4 o'clock, on its initial trip from San

Passengers I Southbou Welcor

One hundred passengers arrive coast Steamship c or President yest Most of the visit Francisco early t the big monoxate were picked to r sunshine fruit ar In addition to the President car miscellaneous f port Captain T navel voyages The Presidents north shortly a night with s tons of mis

CONFE

CURTISS FEATURES

SPEED: The fastest biplane in the world; equipped with famous Curtiss power plant.

UTILITY: Hydro-aeroplane built to fly from land or water; parts standard and interchangeable.

CONTROL: Instinctive controls for balancing, elevating and steering; double wired, separately connected.

COMPACTNESS: May be packed for shipment in two boxes in one hour; weighs 1,000 pounds completely packed.

ECONOMY: Simple in mechanical details, requiring no trained labor; fewer repairs than other aeroplanes.

SAFETY: Rigid frame, laminated and double trussed; no warping to weaken structure of planes.

STRENGTH: Strong, rigid, shock-absorbing chassis; double covering on all planes; effective vibration absorption system.

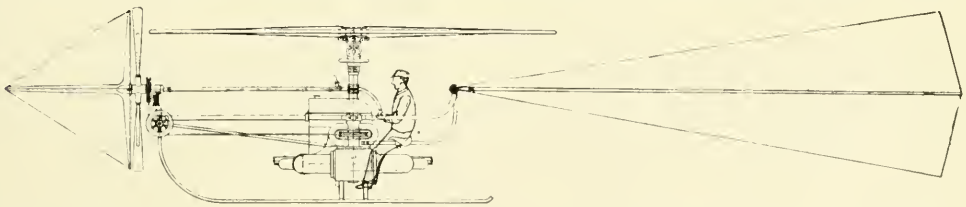
IT HAS STOOD THE TEST
ITS CONSTRUCTION IS BASED ON EXPERIENCE

Orders for late Spring and early Summer deliveries should be sent promptly.

For terms and delivery dates address:

CURTISS AEROPLANE CO., 1737 BROADWAY NEW YORK

"WHO ENTERS HERE LEAVES DEATH BEHIND"



She won't upset in a whirlwind mind, and goes like where the lost Souls are confined—Birdman? Her engines will turn more heat into work than ever before, combining the best features of Hot Air with Internal Combustion.

JOS. E. BISSELL (Box 795) PITTSBURG, PA.

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DEVELOPMENTS IN

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WHAT THE DOMAIN OF THE AIR REALLY MEANS

This intensely interesting series of articles will discuss, in the light of what Professor Tyndall called the scientific use of imagination, the result of the work of the engineers in the air.

This series will be commenced in CASSIER'S MAGAZINE FOR MAY, 1911, and continue through the year

Do not miss this series of valuable articles

SPECIAL OFFER

Cassier's Magazine from May to December, 1911, covering all these articles, 8 months for $1.50 Regular subscription price, $3.00 a year. Or twenty months subscription, May to December, 1911, and the twelve months of 1912. 20 months for $4.00

The Cassier Magazine Co., 12 West 31st St., New York

Simon has now become famous, caused amusement as well as real fear for his safety in some of his daring exploits.

NO BELMONT ELIMINATION MEET.

The meet planned by the Aero Club of America for the latter end of May at Belmont, during which the American team in the Gordon Bennett aviation race would be selected after an elimination race, for which Robert J. Collier has offered a $5,000 prize, has been called off as it did not appear that enough aviators could be expected to enter to insure a meeting comparable to that of last fall. It also seems certain that there is no machine in the hands of Americans at the present time that will have a look-in for the Bennett prize.

There is still the hope that the Wright Brothers will bring forth another speed marvel which will be far and ahead of the one which Brookins had the misfortune to smash at the Belmont meet.

NEXT MEET PURELY SPORTING.

It is very likely that the next meet conducted by the Aero Club of America will be run on a purely sporting basis. This is a step in the right direction. The publication of a note in the last issue of AERONAUTICS urging the placing of flying on a sporting basis suggested a good strong speech on the same subject by Major Reber at the Collier dinner. The club will demand entrance fees and all contests will be contests in fact as well as in name. It will mean that makers will have to do their best to produce machines suitable for the contests in which they enter. Heretofore there has been no incentive of this kind at the meets.

Competition in meets conducted on a sporting basis would be a privilege for the entrant. In the past it has been necessary for the promoters of meets to pay out considerable sums as appearance money, the result being the prizes were nominal.

Competition is a matter of life or death for an aviation meet, as has been amply proven. The excitement is gone when the conclusion is foreseen. There ought to be just as great an element of uncertainty about the result in an aviation contest as in a horse race.

GORDON BENNETT AVIATION RACE.

There will be 15 aeroplanes in the international aviation race to be run in England on July 1; three each from America, Austria, England, France and Germany.

P. O. Parmelee (Wright) is desirous of competing if the Wright Company decides favorably. Charles F. Willard with his Gnome-engined Curtiss has written in for details. Americans abroad will have the privilege of flying before official timers and will have a chance on the team.

OPEN FOR ENGAGEMENT.

Listing in this column is free. State qualifications, kind of machine, permanent address and experience at flying, giving places where flights were made.

CAPT. THOMAS S. BALDWIN, Box 78, Madison Sq. P. O., New York, Baldwin biplane. Pilot A. C. America.

WALTER JOHNSON, care Thomas Brothers, Bath, N. Y., Thomas biplane.

WM. EVANS, 2024 Agnes Ave., Kansas City, Mo., biplane.

LADIS LEWKOWICZ, 51 West 84th St., New York, Bleriot monoplane. Pilot A. C. France.

CALENDAR FOR THE UNITED STATES.

May 4-6—Boston, glider contests of Harvard A. S.

May 4-7—Wichita, Kan., Curtiss exhibition.

May 4-7—Washington, D. C., Curtiss exhibition.

May 11-13—Bridgeport, Conn., Curtiss exhibition, with McCurdy, G. H. Curtiss and Beachey.

May 29-June 2—Wilkesbarre, Pa., Curtiss exhibition, Beachey, McCurdy, Ward.

May 29-June 3—Columbus, O., Wright exhibition.

June 2-3—Fort Wayne, Ind., Wright exhibition.

June 9-10—Joliet, Ill., Wright exhibition.

June 13-14—Peoria, Ill., Wright exhibition.

July 1—Gordon Bennett aviation race, England.

July 10—Gordon Bennett balloon elimination, Kansas City.

July 17-24—Saratoga Springs, N. Y., meet. Date and arrangements not certain.

August 26-September 4—Boston, meet of Harvard A. S.

October 5—Gordon Bennett balloon race, Kansas City.

January 10-20, 1912—Los Angeles, aviation and arrangements not certain.

AERONAUTICAL MANUFACTURERS ASSOCIATION *(Continued from page 162)*

The following letter from Mr. Custis points out some pertinent matters:

Philadelphia, April 19, 1911.

Editor of AERONAUTICS,
New York City.

Dear Sir:—

The proposed organization of a national aeronautical trade body seems to me the most important step forward ever conceived by the exponents of the science and industry in this country. The formation of an aeronautical manufacturers' association should accomplish even more than is outlined in the tentative plan that has been made public. The industry has now reached a point where its members need more accurate recognition in their individual lines, as well as protection from charlatans. Through such an organization as is proposed, the legitimate dealer in aeronautical apparatus and equipment will be strengthened, and his opportunities for developing his end of the industry will be increased.

It seems to me most important, too, that through the medium of such an organization the public shall be made to realize that the aeronautical industry is already established on clean business lines. There seems to be some misapprehension on this point, many persons assuming that aviation, in particular, has not yet reached the stage of development where there is standardization of materials and accessories. Those of us who know how splendidly the various branches of this new industry have been built up, in the face of scepticism and extraordinary liability of loss, will welcome such a campaign of education as will follow the formation of the new association.

We Americans have encouraged the art of flying with an enthusiasm that at times has threatened to develop into hysteria. The time has come when we should extend more active support and co-operation to the men who make flying possible by the building and improving of the machines. The manufacturers are the men behind the guns. To them, more than to the pilots or aviators, we must look for the future progress of aeronautics.

Faithfully yours,
JOHN TREVOR CUSTIS.

(Mr. Custis is Managing Editor of "The Philadelphia Inquirer," the first newspaper in the United States to have a regular weekly aeronautical section, and is also well known as a writer on aeronautic topics.)

Breguet biplane, which carried 12 people for 3 kilometers at a speed of 60 miles an hour on March 23rd. The engine was a 100-h.p. Gnome. The total weight lifted, including aeroplane and passengers, was 2,600 lbs. Two of these Breguet machines have been supplied to the French army to use on the western coast of Africa to carry mail. The following day Roger Sommer carried 12 passengers, or 13 in all, flying a kilometer. A few days previous Sommer carried 8 people for 1½ hours.

NOTES FROM ABROAD

FLIES FROM LONDON TO PARIS.

Pierre Prier Makes the 223 Miles Without a Stop.

BREAKS CROSS-COUNTRY RECORD.

Journey Occupies 236 Minutes.

Issy-Les-Moulineaux, April 12.—The aviator, Pierre Prier, flying a 50 Gnome Bleriot, arrived here at 5:33 o'clock this evening from London, having made the trip of about 223 miles, without a stop, in 236 minutes.

Prier left the aviation grounds at Hendon, near London, at 1:37 in the afternoon. Above the English soil the aviator found fogs and squalls, and, going higher and higher in an endeavor to obtain better weather, crossed the English Channel near Dover at a height of over 3,000 feet.

Leaving the channel behind him, Prier encountered fine weather until he reached Beauvais, fifty-four miles from the French capital, and from that city the rest of his voyage was made through a haze.

Prier is an instructor at the Bleriot school in England

The average speed was more than 56 miles an hour.

WHITE, BLERIOT, MAXIM, LTD.

On April 1 the organization of the above company was announced, and subscriptions to stock are being solicited. Three of the five directors are Sir Hiram Maxim, Louis Bleriot and C. G. White. White has been engaged as manager for ten years, Bleriot as technical adviser for five years, and Sir Hiram Maxim as chairman of the company.

The capital stock is $1,000,000, of which 300,000 shares are offered to the public at par; 260,000 shares ($325,000) have been issued in part payment of the purchase price, together with $160,000 in cash. The company takes over flying ground, the British patents of Bleriot and inventions, present and future, for Great Britain, Colonies and India; $35,000 will be spent on the erection of factories and $25,000 for the purchase of machines, leaving available for working capital out of the stock to be sold a sum of $113,000.

The prospectus states that Bleriot has sold from his factory in France more than 300 monoplanes, and it is expected that the company will dispose of 100 machines the first year at a profit of $1,000 a machine. Aeroplane sheds will be rented at an average yearly rental of $500 each. During the past 14 months 200 pupils have been instructed at Bleriot schools in France, and 100 pupils yearly are figured on for the new company. It is proposed also to give exhibitions, the receipts from which are figured at $50,000 for the year. The estimated yearly revenue from the company is figured to be $197,000, of which but $60,000 are expenses.

MICHELIN CUP RULES.

The holder of the International Michelin Cup for 1911 will be the one who covers the greatest distance over a closed circuit before November 1. The distance must exceed 582.935 kilometers. The flight must be made around two points and not less than 50 and not more than 100 kilometers from each other, in the proximity of a large town. He is permitted to land as often as necessary to take on oil and gas. But the time will be counted in as for the lap, and the total time for the lap must not equal or exceed a time calculated by the timekeeper as representing a speed for that circuit of 50 kilometers per hour.

THREE MORE DEATHS.

An Italian aviator, Joseph Cei, flying a Caudron biplane, met his death on March 28. Crossing the River Seine on an attempted cross-country flight, the motor failed and he fell on an island. He was taken to a hospital, but died three hours later.

CHEVREUSE, France, April 14.— Lieutenant

FOX AERO MOTOR

THE notable achievements of Mrs. Raiche at Mineola have proven the power and endurance of Fox Aero Motors in actual flight. *The First Woman Aviator in America.*

¶ Fox Aero Motors are the simplest, most reliable and most powerful Aeronautic Motors yet produced. They are two-cycle water cooled, and are guaranteed against overheating under all conditions. They are equipped with the Fox Fourth Port Accelerator, the greatest improvement ever made for increasing the speed, power and flexibility of two-cycle motors.

¶ Remember Fox Marine Motors hold the world's endurance record for motor boats, and even our first aero motors have commanded instantaneous attention by their remarkable and consistent performances.

¶ Fox Aero Motors are made in six sizes, 24 to 150 H. P., four, six and eight cylinders. Full details and prices on application. Deliveries guaranteed.

The Dean Mfg. Co.

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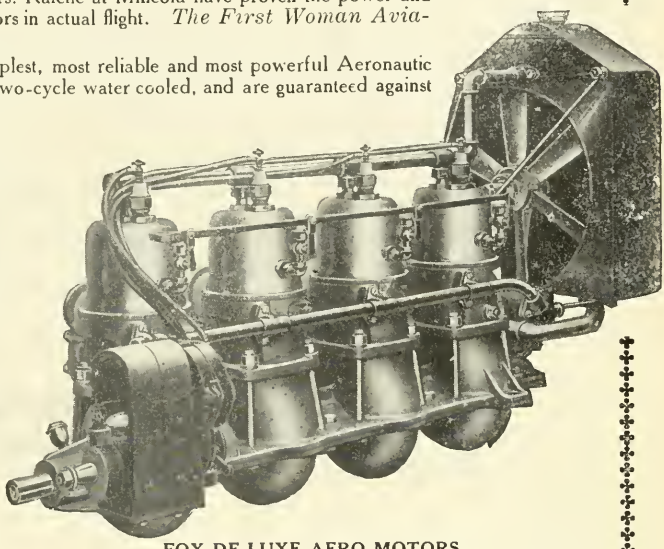

FOX DE LUXE AERO MOTORS
These Motors have radiator attached at the forward end and are without fly-wheel

FRED P. SHNEIDER

Manufacturer and Exhibitor of Biplanes and Monoplanes

MEETS ARRANGED

FLYING TAUGHT, FEE $250

School and Flying Grounds at Belmont Park

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1020 East 178th Street :: :: :: New York

Grahame-White Biplanes

CONVERTIBLE TYPE FOR ONE OR FOR TWO PASSENGERS

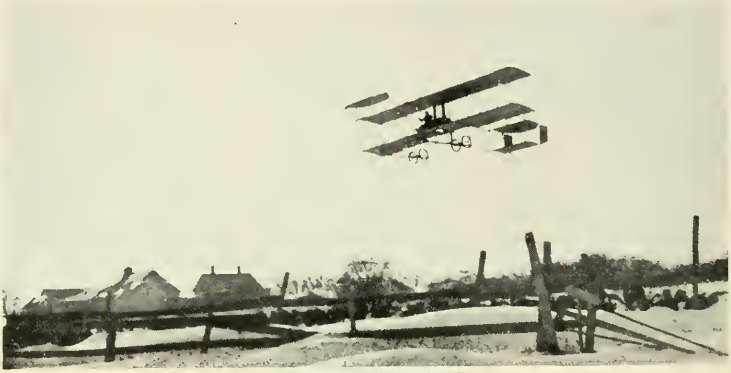
RELIABLE—FAST :: Built to the exacting requirements of MR. C. GRAHAME-WHITE

By BURGESS COMPANY AND CURTIS, Marblehead, Mass.

BURGESS BIPLANES

(Licensed under the Wright patents)

Single-passenger models B and C



Two-passenger model D

MODEL D IN FLIGHT

Two Striking Endorsements: ¶ Mr. C. Grahame-White's first order was for SEVEN Biplanes designed and built by us. ¶ The Wright Company, on account of the excellence of our construction, invited us to become the first manufacturers in America licensed to build aeroplanes under their patents.

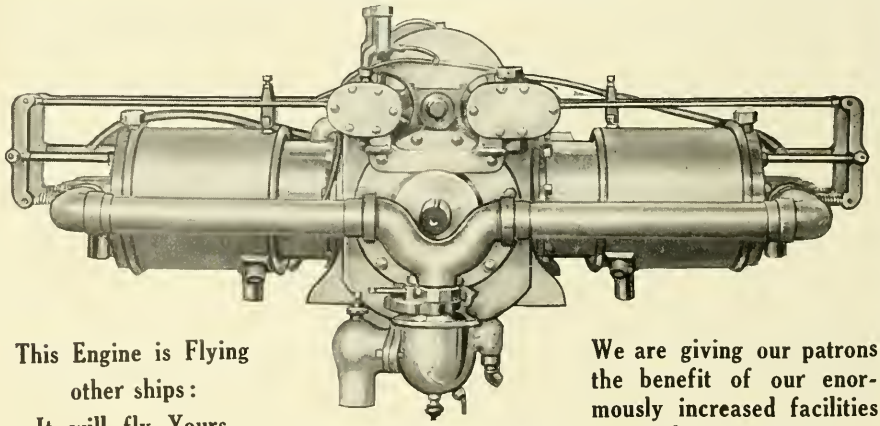
Burgess Company and Curtis Marblehead, Mass.

THE CALL AVIATION ENGINE

The Aviation Engine Without a Peer

Right in Principle. Artistic in Design. Powerful in Action.

Perfect in Material and Workmanship.



This Engine is Flying other ships: It will fly Yours.

Write for our Special Prices

We are giving our patrons the benefit of our enormously increased facilities for the 1911 season.

The Aerial Navigation Company of America

GIRARD, KANSAS

The Morane Monoplane.

Byasson, of the Navy, while making an aeroplane flight here to-day, fell with his machine and was mortally injured.

Lieutenant Byasson died later. He was maneuvering a monoplane over the field here when the machine capsized.

VERSAILLES, France, April 18.—Capt. Carron, of the French Army Aviation Corps, fell with his aeroplane from a height of 250 ft. today and was crushed to death. The aviator left Orleans for this city and was midway between Villacoublay and Versailles when his machine plunged to earth, turning over as it fell. Carron was caught under the wreckage.

MEXICO BUYS AEROPLANES.

It is understood that the Mexican government has placed an order for six aeroplanes in France. Roland Garros of the Moissant International Aviators, upon his return from France, for which country he left America in April, will take charge of the aviation department of the Mexican army after completing his contract with Moisant.

The poor showing made in Mexico by the machines of J. J. Frisbie and Charles K. Hamilton has materially assisted in turning the order for the aeroplanes abroad. Hamilton, as is well known, severed his connections with the Moisant aviators at Mexico City and Frisbie broke his propeller the first time he tried to fly, and, unfortunately, this created a bad impression of the American machine. E. L. Ramsey of Vera Cruz has started the construction of a Bleriot XI, which he expects to equip with an American engine.

E. L. RAMSEY.

PROFITS OF GNOME ENGINES.

The last fiscal year the Gnome engine makers made $459,359 net profits, nearly twice the capital of the company. The net credit balance was $355,824.

The Bleriot factory made $66,800 net; capital $260,000.

WINS $4,000 PRIZE.

On April 24 Pierre Vedrine, who left Paris in his 100-h.p. Gnome-engined Morane monoplane on April 22, arrived in Pau on Monday, April 24, covering a course of 500 miles in 6 hours 55 minutes actual flying time, winning the $4,000 prize offered for the fastest flight between the two cities by way of Bordeaux. Several stops were made on the way. Several trials have previously been made by him, each ending in an incident which necessitated a new attempt. On March 31 he flew back from Poitiers to Paris, after one of his attempts, a distance of 180 miles, in 2 hours 12 minutes, with a 25-mile wind behind him. His speed averaged 81.8 miles an hour. At times his speed was 94 miles an hour. On the way out his speed was 67 miles an hour.

NEW SPEED RECORDS AT PAU.

On the 12th of April Alfred Leblanc (Bleriot) established a new speed record of 68 miles an hour. The new times are as follows:

5 kil.—2 m. 41. s.
10 kil.—5 m. 30.8 s.
40 kil.—22 m. 12.2 s.
50 kil.—27 m. 41.1 s.
100 kil.—54 m. 55.6 s.

The time for 20 and 30 kilometers was slower than the Belmont figures. The new records for a certain period are as follows:

¼ hour— 26.1996 kil.
½ hour— 53.4246 kil.
1 hour—108.4246 kil.

German Wright machines are being equipped with 50-h.p. M. A. G. engines and automatic compressed air starters to start the engine after soaring.

Apparently nothing further has been done with the Bleriot XIII which carried eight people.

THE NEW FRAUD MEDIUM

(*Continued from page 165*)

charlatan, the fakir, the schemer and the fraudulent promoter.

April 5, 1911.

I have been reading regularly six aeronautic publications, but I must say I think they are mostly "twaddle." Your editorials on "What Our Aeroplane Builders Need," and "Stop! Look!! Listen!!!" are excellent. There is grave danger of discrediting the "game" in its early stages, which will set it back twenty years in development. I have had some experience with the wireless telegraphy business, and that is what happened there, alas! Hoping you will continue your excellent policy of "show down," I remain, Very truly yours,

SUBSCRIBER.

News In General

WRIGHT PATENT CASES.

So many inquiries have been received regarding the status of the Wright suits that the following summary is printed:

The Wright Company's testimony in the Wright-Curtiss case is in, and the Curtiss testimony is due within a limited period. It is believed that the Curtiss testimony will be taken shortly.

In Germany, the Wright patent has been upheld. The litigation in France has not yet been actually settled. Reports from France state the foreign makers no longer deny that their appliances constitute an infringement. They only contend that the value of the patent of 1903 is rendered null by the publicity which they say was previously given to the invention. The suit in this country against C. G. White has not been settled. White has, it is said, been advised by his attorneys not to defend the suit, but let it go by default, on the ground that the makers of the aeroplanes, Farman and Bleriot, should protect the user. If this case should go by default, it will secure the Wright Company the right of obtaining injunctions on Farman and Bleriot machines. The suit against Louis Paulhan is still open.

PRIZES FOR AMATEURS.

R. O. Rubel, Jr., & Co., of Louisville, Ky., manufacturers of the "Grey Eagle" Curtiss-type biplanes, and jobbers and retailers of aeronautical supplies, have offered 40 handsome silver trophies valued at $1.500 as prizes for flights made with aeroplanes equipped with power plants purchased of them.

The cups are offered in five classes: (A) to the first 27 aviators who make a 500-yard flight within 90 days from receipt of motor; (B) to the first 10 who fly for 30 minutes within 90 days of receipt of motor; (C) the first aviator who carries a passenger for 10 minutes; (D) for the longest cross-country flight during 1911 and the first two months of 1912; (E) to the aviator who stays up the longest period over an hour before February 29, 1912. The cups increase in value consecutively in classes B, C, D and E.

The Rubel company handles the following motors: Gnome, Brott, Kirkham, Harriman, Aircraft, Gray Eagle, Elbridge, Detroit Aeroplane, Fox, Emerson, Boulevard, Call, Aeromotor, Rinek and DeChenne.

CURTISS BACK EAST.

Glenn H. Curtiss arrived in his home town of Hammondsport, N. Y., on April 17, after finishing the winter experiments with the hydro-aeroplane and the training of the army and navy officers at San Diego, Cal. He stopped off at Salt Lake City to give an exhibition with the water machine, and spent a day at St. Louis.

No definite plans have been made as yet in regard to the near future of the work at Hammondsport. Mr. Curtiss has personally purchased the factory from the receiver of the bankrupt Herring-Curtiss Co. for $25,100. The mortgage which he holds on the plant is considered as part payment. It will be operated by the Curtiss Aeroplane Co.

INCORPORATIONS.

Aero-Development Co., 1327 S. Broad St., Philadelphia, Pa. Capital stock, $1,000,000. J. H. Keeler, G. R. Combs, Henry Keeler and Wm. A. Hutson.

Lundgren Aeroplane Co., Youngstown, O. Capital stock, $10,000. Will build machines patented by Earl Lundgren.

Burgess-Wiseman Mfg. Co., Cleveland, O. Capital, $10,000. E. H. Wiseman, president; R. C. Burgess, secretary-treasurer; W. P. Clevey, manager.

Detroit Aeronautic Construction Co., Detroit, Mich., $65,000. Max Dingfelder, president; Emil W. Snyder and John T. Patterson.

The Aircraft & Auto Parts Mfg. Co., Branford, Conn., has been incorporated with capital of $24,000. The directors are Edwin E. Roberts, Frank W. Gordon and Frank S. Bradley.

United Aeroplane Mfg. Co., New York, $100,000. The directors are: William G. Lovatt, 144 W. 64th St.; David A. Sterling, 28 W. 112th St., New York City; J. Harry Aushutz, 724 Washington St., Pittsburg, Pa.

Dillon Aviation Co., Dillon, S. C. The promoters of the company are: W. Murchison, J. D. Manning, F. Thompson, Fred. E. Rowe, R. L. Lane, J. L. Bridgers, E. V. Richards.

Chickasha Aeroplane Co., Chickasha, Okla., $1,500. C. C. Kirkpatrick, M. S. Blackburn.

Cooley Aerial Navigation Co., New York. Manufacturing aeroplanes, etc. Capital, $70,000. Incorporators: J. Cooley, Rochester; J. Goldenson, A. D. Cameron, New York City.

National Aerial Navigation & Equipment Co., Cullman, Ala. Incorporated with $125,000 capital stock. Fred. J. Buchanan, president; L. N. Buell, secretary; George Steifelmeyer, treasurer; Fred. L. Schauffler, manager.

The Baltimore Monoplane Co., incorporated to build aeroplanes, have elected the following officers: President, D. J. Carter, 2009 Boone St.; vice-presidents, W. L. Anderson, 911 N. Gilmor St., and Dr. Clinton Blades, N. Broadway; secretary-treasurer, Edward Wolfsheimer, 710 Newington Ave.

BALDWIN HOME.

Capt. Thomas S. Baldwin has returned from his tour with J. C. Mars and Tod Shriver through the Orient. This last winter they left San Francisco for Honolulu, where flights were made. From there the tour followed to Hong Kong and Tiapo, in China; thence to Manila, back to Shanghai and from there to tthe following points in Japan: Nagasaki, Kobe, Osaka, Kioto, Yokohama and Tokio.

The second Baldwin machine was sold, after putting in Shriver's Kirkham engine, to an experimental school in Manila. The Curtiss engine which Captain Baldwin had been using was put in the Shriver 'plane and Mars had the first Baldwin 'plane with the Hall-Scott engine, which the captain bought while in 'Frisco.

A new machine is being built at Mineola now with parts made to specifications by C. and A. Wittemann, in which one of the two new type A-2 Hall-Scott motors ordered will be installed. This will be along the same lines as its predecessors, but with longer ribs and less spread to the planes.

Mars and Shriver were to leave for home on April 15. Great crowds attended all the exhibitions. In one place the number was given as 400,000.

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CUPS FOR MODEL BUILDERS.

Two solid silver cups, both 18 in. in height, are to be competed for by amateur aviators in a series of model aeroplane contests under the auspices of the West Side Young Men's Christian Association, No. 318 W. 57th St. The cups are identical in make and design.

A. Leo Stevens, the aeronaut, has given one of the cups, and the other is the gift of Sydney B. Bowman, the American agent for the Clement-Bayard airships and the Santos Dumont Demoiselles.

The Bowman cup is to go to the best constructed model aeroplane and the Stevens cup is for the longest flight. Both cups will be awarded at the close of the contests for the season.

The contests are open to boys between the ages of 12 and 18 years, whether or not they are members of any Y. M. C. A. The only conditions are that the model aeroplanes must be made by the boys and must rise from the floor under their own power.

Besides the cups, Louis F. Ragot of the New York Aero Club offers a silver placque for the model aeroplane showing the greatest lifting power.

NEW BOOKS.

THE FLIGHT OF BIRDS, by Giovanni A. Borelli, is the title of the sixth installment of the "Aeronautical Classics" published by the Aeronautical Society of Great Britain, which may be had at one shilling from King, Sell & Olding, 27 Chancery Lane, London, W. C. This is edited by T. O'B. Hubbard, secretary of the Aeronautical Society, and J. H. Ledeboer, editor of British AERONAUTICS.

QUESTIONS AND ANSWERS FOR AUTOMOBILE STUDENTS AND MECHANICS. By Thomas H. Russell, A. M., M. E. Published by Charles C. Thompson Co., Chicago, Ill., at $1 Bound in cloth. The book includes 600 questions and answers on engines and motor cars. There is a great deal of material in here of prime interest and value to the experimenter who is buying or using an engine.

ELEMENTARY AERONAUTICS, by Albert P. Thurston, B. Sc., 8vo., cloth, 126 pages, illustrated, published by The Macmillan Co., 66 Fifth Ave., New York, at $1.25.

Contents:—Normal and Inclined Planes; Aerocurves; Automatic Longitudinal Stability and Manual and Automatic Control; Automatic Lateral Stability; Propellers; Helicopters; Calculations Relating to the Design of a Flying Machine; Laboratory Instruments and Apparatus; Types of Machines; Aeronautical Engines.

The aim of the author has been to present to the reader a simple and concise account of the action of air upon moving planes, aerocurves, propellers, bars and the like, and the application of these principles to practice.

In a letter to the Wright Company, P. O. Parmalee tells of descending into the Rio Grande River on the recent trip from San Antonio to El Paso, 106 miles each way. After dragging the aeroplane out on the banks they found that the wings were not affected a particle by the thorough drenching. The cloth was absolutely moisture-proof and did not shrink a particle. Had it been any other fabric, Mr. Parmalee says, the wings would have been twisted all out of shape by shrinking of the cloth.

T. B. Funk, an automobile agent in Dallas, Tex., will soon have a Wright flyer, the first to be owned by a Texan.

Harry S. Harkness is reported to have given the big biplane built for him by the Eaton Bros., of Los Angeles, to his mechanic, J. E. Kiley. The machine, along Curtiss lines, with a biplane tail and double vertical rudders, fitted with a Macomber rotary engine, was given its first flight on April 8 by C. F. Walsh, who made a 3-mile flight. Kiley himself then took it and, after some grass-cutting, flew it for a straightaway jump.

C. F. Walsh had his old machine out on April 9 and 12, with Elbridge engine, trying for a pilot license. A broken wire delayed trials and, as the machine is old, he will transfer the motor to a new plane.

Otto Brodie, who flew the Curtiss machine bought by James E. Plew, of Chicago, has been making flights with the Farman sold a Chicago concern by Clifford B. Harmon. A Gnome engine and Gibson propeller is used.

R. St. Henry, a Canadian, is the latest graduate from the Curtiss California school.

C. F. Walsh, of Los Angeles, after putting J. J. Slavin's old Elbridge engine in his own machine, made a 15-minute flight.

Hugh L. Willoughby's "Pelican" is almost completed and is now being taken in boxes to his aerodome at Atlantic City to be finished.

Dr. Walter F. Provan, dentist, of Dorchester, Mass., and Gil Rankin, N. E. Agent for AERONAUTICS, 1 Beacon street, Boston, are building a monoplane especially for passenger-carrying cross-country flights. It is along the general lines of the Bleriot 12, a notable feature being the elimination of special fittings, for in so far as possible every bolt, nut and other fitting will be of "stock" hardware that can be easily replaced anywhere at any time in case of accident.

The wings will measure 16 ft. by 7 ft. 6 in., making the spread about 34 ft. and giving a sustaining surface of 204 sq. ft. in the main planes. The chassis will extend back 10 ft., and at 11 ft. there will be a take-down joint; another at 16 ft. back, the length of fuselage being 26 ft. in all. The stabilizer tail will be fan-shaped, 10 ft. long by 6 ft. at the extreme end, to which will be added the elevating rudder. The vertical rudder will resemble Harroun's, as will, in fact, the whole tail.

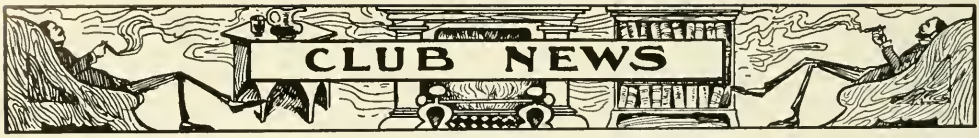
Dr. Provan is well known locally as a wrestler, having held the N. E. amateur championship until recently.

H. F. Kearny, who attempted to fly the Pfitzner monoplane at the Boston meet, suddenly appeared in St. Louis with a Farman-type machine. Leland Scott, of the Hall-Scott Motor Co., supplied an engine for the trial, and on April 16 made one flight, his first, in this machine. A broken stay wire caught the propeller and broke it.

Thomas Benoist, of the Aeronautical Supply Co., St. Louis, is building more machines for his school work.

Mr. Orvar Meyerhoffer, of Oroville, Cal., has been making some good flights in that vicinity, but on his last met with an accident. After flying in fine shape for ½ mile, in passing over a tree, his running gear caught in the topmost branches and threw the machine to the ground. The belt device that operates ailerons undoubtedly saved Mr. Meyerhoffer's life, as he was violently thrown forward and would have been thrown out of the machine but for the belt. The machine escaped without any serious injury, despite the height from which it fell. This is no doubt due to its very strong construction. Apropos of this, Mr. Meyerhoffer can, by supporting both ends of the machine, take off the tires, etc., the machine being suspended by the end supports; furthermore, it is so rigid that he can walk from end to end on the top while suspended.

The British War Office Committee has now been appointed. It consists of three officers appointed by the War Office, C. Grahame-White, Alexander Ogilvie, Roger Wallace and Col. J. D. Fullerton representing the Aeronautical Society, with two or three more. One meeting has already been held.



A. C. A. FIRST TO HAVE OWN CLUB HOUSE.

The Aero Club of America is to have one fine big club house at 297 Madison avenue, New York, corner of Forty-first street. It is a five-story private dwelling house, of unusually attractive and dignified architecture.

At a meeting of the members, at which more than a dozen were present in person and over a hundred by proxy, held April 10th, it was unanimously voted to secure a two-year lease of the property at a rental of $5,000 a year. The sum of $2,500 was made available for some slight changes in furnishings and the installation of suitable furniture. A buffet will be arranged and members will have the privilege of putting up out-of-town guests there. The house is very nearly complete as to hangings and carpets, so that little money is needed in this direction.

It is the plan of the members and officers who started the club house movement to increase the membership and provide an attractive place where members may congregate. Up to the present the club has not been in a position to support a club house of its own and has occupied small quarters which were used more for an office than anything else. They were certainly not attractive for members, but it is hoped that this is all changed and that henceforth the having of a home will stimulate greater activity.

A. C. A. BANQUET.

The Aero Club of America held its fifth annual banquet on March 29, attended by about 150 guests. Allan A. Ryan presided, with James C. Montgomery as toastmaster. The guest table was decorated with trophies won by pilots of the club, including the Lahm Cup, the Gordon Bennett balloon and aviation, the Duration Cup, won by Arch Hoxsie at the Belmont Park meet; the Michelin Trophy, won by Wilbur Wright in 1908, and the Scientific American Cup, won by Glenn H. Curtiss in his flight from Albany to New York.

Mr. Montgomery's remarks occasioned considerable merriment owing to his lack of knowledge of aviation matters and the fact that he almost presented to Alan R. Hawley the cup intended for Glenn H. Curtiss. In the absence of Mr. Curtiss, Augustus Post received the Scientific American Cup for the longest flight from Charles A. Munn, owner of the "Scientific American."

Brigadier-General James Allen, Chief Signal Officer of the U. S. Army, whose remarks are printed in abstract elsewhere, made the principal address of the evening.

THE AERONAUTICAL SOCIETY HAS PERMANENT ROOMS.

At the Aeronautical Society's general meeting held March 23d, a resolution was unanimously passed renting the rooms on the eighth floor of the building, 250 West Fifty-fourth street, opposite the Automobile Club, beginning May 1st. The furnishing and lighting and general arrangement of the rooms has been finished and a library of patent publications, periodicals, models, photographs and other paraphernalia will be provided for the benefit of members at any time they choose to call, whether for lounging or studying.

LECTURES CONTINUE.

E. W. Marshall, of the American Society of Mechanical Engineers, patent expert and attorney, made a most interesting address on "Practical Experiments and Demonstrations with Gasoline." The interest was enhanced by the simple nature of the experiments and the non-technical language describing them, and was particularly instructive in illustrating clearly the harmlessness as well as dangers in the use of gasoline. A gasoline can was lit at the opening, showing that there was no danger of explosion, and upon heating some gasoline in a test tube it was shown that the fumes are heavier than air and could be ignited considerably below the opening of the test tube but not above. Mr. Marshall smoked a cigar and extinguished it in gasoline, proving that the embers of a cigar are not hot enough to ignite gasoline, and then he made a carburettor of this cigar by drawing in from this saturated cigar and blowing a mixture which ignited over an alcohol flame. Water is not a proper extinguisher for a gasoline fire, because it goes to the bottom and does not have the effect of smothering the flames was clearly shown in a small bowl which was ignited and then water poured on, which went to the bottom and was not extinguished until a chemical extinguisher was poured on, creating fumes that filled the flame. A paper bag was inflated with a combustible mixture through spraying gasoline through a perfumery spray nozzle and exploded by an electric spark while the bag was held in the hand. Kerosene oil was heated in a test tube to show that the fumes emanate therefrom were equivalent to the fumes of cold gasoline and demonstrating the fundamental differences in an oil engine and gasoline motor. To prove that gasoline without the connection of air to add oxygen was not in itself inflammable or dangerous, an electric spark plug was introduced in a glass filled with gasoline and a continuous series of visible sparks ensued without any result until the spark plug was drawn away from the liquid where the oxygen came in contact, when it was ignited above the liquid.

On April 13th the general meeting was addressed by Prof. Dwight Hering, of New York University, on compressed air, illustrated with lantern slides. His address was particularly clear in language and expression, and very instructive by pointing out the many different uses of compressed air, both for static, passive and dynamic forms.

In its application to aeronautics, Prof. Hering thought there would be many uses, among others the ability to let out jets of air current to counteract disturbances on one side of an aeroplane, and gave illustration of what amount of air can be confined in a tube and its weight and length of operation to enable the members to form their own conclusions with a view to making experiments.

OVINGTON GIVES FINE TALK.

Earle L. Ovington, who has just returned from the Bleriot school of aviation at Pau, France, after having obtained his license, made some very interesting remarks about the conditions in France to-day. Mr. Ovington was formerly president of the Federation of American Motor Cyclists, and becoming interested in aviation through attending the several exhibitions of the Society at Morris Park, and determined to fly his own machine. With this purpose in view, went to France and has brought back with him a Bleriot machine and a certificate as an acomplished aviator. One ramarkable comment Mr. Ovington made regarding progress in France was that no effort is being made to obtain automatic stability, but altogether towards speed or weight carrying capacity, and that the forward attacking edge of the aeroplanes were getting thicker and thicker, showing advantageous results in each instance and proving thereby that there was a law of currents that we do not fully understand yet. The latest Bleriot has a wooden tube structure at the forward edge close to 5 in.

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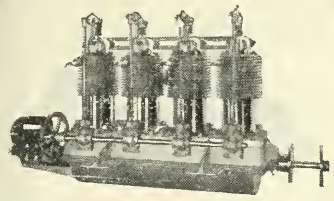

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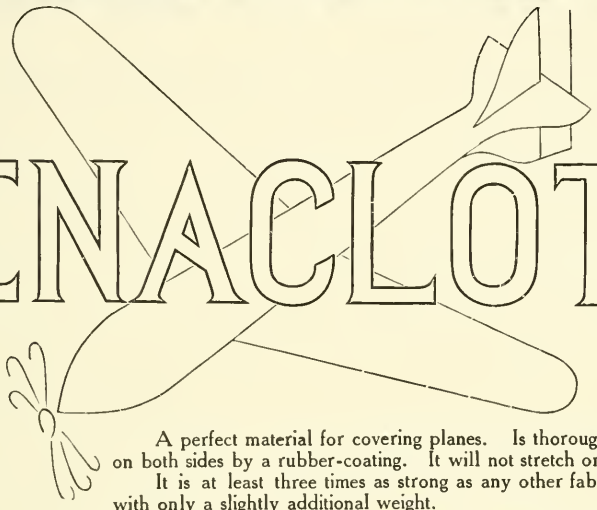

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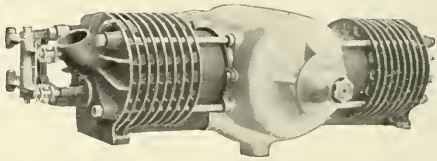

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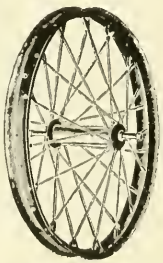

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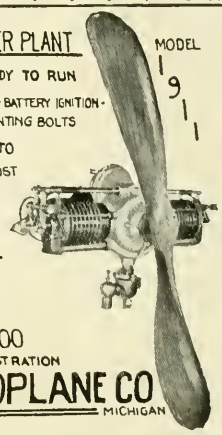

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in diameter which does not seem to present any extreme resistance. Some tails of monoplanes were provided with surfaces of inverse angle which apparently added about 5 miles to the speed without any other difference to the machine.

AERONAUTICAL SOCIETY BANQUET.

By the time this issue is received, the big dinner of the Aeronautical Society, at the Hotel Astor, on April 27, will have been a matter of history. More than 700 guests are expected from all parts of the country. Sir Hiram Maxim, brother of the Society's President, Hudson Maxim, is coming and several foreign clubs have appointed delegates.

Among the notable guests are: President William H. Taft, Hon. George von Lengerke Meyer, Hon. Jacob Dickinson, Hon. William Randolph Hearst, Hon. Charles D. Walcott, Prof. Robert Simpson Woodward, Dr. Willis L. Moore, Dr. John Henry MacKracken, Hon. Edward B. Moore, Brig.-Gen. James Allen, Hon. J. S. Martine, President Ackerman, of the Senate of the State of New Jersey; Hon. John J. Fitzgerald, Hon. Timothy D. Woodruff, Hon. John W. Goff, Admiral Fletcher, Rear Admiral O'Neil, Col. O. B. Mitcham, Capt. Washington Irving Chambers, Hon. James M. Beck, Dr. W. Payson Richardson, Gutzon L. M. Borglum, John Temple Graves, Arthur Brisbane, Glenn H. Curtiss, J. A. Haskel, Thomas Sopwith and many others.

There are sixty-two boxes in the big ball room, and these are not being sold, but are being apportioned in return for voluntary donations to create a fund to erect a monument at Washington, D. C., in memory and honor of those who have lost their lives in the cause of aviation. Applications have come in with checks varying from $50 down to $10.

The Aero Club of Cuba, Havana, has affiliated itself with the Aero Club of America. The list of officers and members are as follows: President, Regino du Repair de Truffin; Vice-President, Dr. Ricardo Dolz; Secretary, Dr. Manuel M. Coronado; Vice-Secretary, Evelio Cuervo; Treasurer, Juan Arguelles; Consulting Engineer, Dionisio Velasco; Directors, Marco A. Carvajal, Ramon G. Mendoza, Enriqu Conhill, Orestes Ferrara.

Among the members are: Elicio Arguelles, Emilio Alamilla, F. D. Duque Galdos, Joaquin Gelats, Ernesto P. de la Riva, Ernesto Sarra, Bienvenido Saavedra, Herman Upmann, Ignacio Weber, Carlos de Zaldo.

The Aero Club of Illinois has established permanent headquarters at Room 130, Auditorium Hotel, Chicago, Ill.

NEW AIR CLUB FORMED TO PROMOTE AVIATION.

The Aviation Club of Nebraska, which expects to build, exhibit and operate aeroplanes in Omaha, has been organized by a number of Omahans interested in aerial navigation.

Clarence E. Adams, former sergeant of Fort Omaha Signal Corps and builder of several aeroplanes, was elected chief aviator, and J. J. Deright was chosen business director and manager. The other officers are: Harry Sackett, assistant chief aviator; Ray L. Whitmore, president; Hugo Heyn, vice-president and photographer; Leonard Sjoberg, recording secretary; Daniel McCarthy, treasurer; Arthur Frenzer, correspondent; Louis Wade, assistant correspondent; Fridolf Engstrom, inspector, and Kenneth Norton, field officer; Carroll Engstrome, librarian.

The club now has two aeroplanes and six gliding machines, which were ready for operation April 1.

Aero Club of Long Island, incorporated April 22, 1911, with office at Garden City. The club has leased several hundred acres of land between Garden City and the Meadow Brook Club. The directors are: Gage E. Tarbell, head of a local land company; Philip Wilcox, Frederick J. Dollinger, assistant secretary of the National Council: A. J. Moisant, A. E. W. Uppermann and Albert S. Le Vino, of the Moisant International Aviators.

The **Michigan Agricultural College Aero Club,** East Lansing, Mich., has been organized among a number of students of the Engineering Department. The club has the use of a glider owned by one of the members and will probably undertake the construction of a Curtiss-type machine.

The officers are as follows: Ion J. Cortright, president; H. W. Schneider, vice-president; A. N. Hall, secretary; A. M. Lynn, treasurer.

The **Southwestern Aeronautical Association** has been incorporated under the State laws of Texas.

It may be well to state that the old Aero Club of Fort Worth was the father of this organization. After its failure the Southwestern Aero Club was created, changing into the Southwestern Aeronautical Association.

HOWARD H. MARTIN,
P. O. Box 821.

The **Aero Club of Pennsylvania** held a meeting on April 7, which was addressed by Geo. H. Cove and W. C. Jennings. Mr. Jennings showed, among others, a picture of Boston, taken from a balloon. On the 9th the club surprised the veteran balloonist, Samuel A. King, on the occasion of his 83rd birthday.

Dr. T. Chalmers Fulton, president of the Ben Franklin Aeronautical Society, made the address presenting the purse of gold to Prof. and Mrs. King.

Prof. King was born April 9, 1828, in Old Cohocksink, and in 1851 made his first ascension in Fairmount Park. Since that time he has made 458 free ascensions in all parts of the United States. In a number of races and distance attempts he has been lost in the region of the Great Lakes and the forests of Wisconsin and Canada. In addition to the many free flights he made and the experiments he conducted for clubs and societies, he held a number of important positions with the United States Government, especially aeronautical adviser and balloonist for the Signal Service.

It is estimated that in his time he has carried more than 1,000 persons in free balloons and thousands in captive ascensions.

The Aero Club of Delaware, Wilmington, has been incorporated.

The Aero Club of San Jose (Calif.) is being formed.

The Milwaukee Aero Club has elected Wm. G. Bruce president; John H. Kopmeier, vice-president; A. O. Smith, second vice-president; Frank A. Cannon, secretary, and Gladstone Cherry, treasurer.

The Aero Club of Connecticut held its first annual banquet at the Stratfield Hotel in Bridgeport, Conn., on April 20. About sixty enthusiastic guests were assembled to give promise of a live organization. Mr. Beers, of New Haven, told of his flights abroad as a passenger in various aeroplanes. He has ordered a Wright machine for delivery in May. Other speakers were: Hiram Percy Maxim, H. A. W. Wood, Allan A. Ryan, Augustus Post, Captain Baldwin and Representative Judson. A. Holland Forbes, the club's president, presided.

To those who delight in calling attention to the alleged special dangers of aviation, one can point out the fact that during 1910 the gentle art of mountain climbing as practiced on the Alps caused the death of 128 people. In 1909 the list totaled 144. In two months out of the twelve, 45 were killed. The fatalities of aviation totaled in 1910, 27. Unfortunately, no figures are at hand on the number of people who enjoyed the pleasures of mountain climbing during this period. It is likewise impossible to arrive at a total of the flights made, but it is safe to assume that there were at the close of the year in all countries in the neighborhood of 2,000 aeroplanes making short to long flights.

IN THE AERIAL MARKET PLACE

NEW EXHIBITS AT "AERONAUTICS."

There have been recently added to the Permanent Exposition at AERONAUTICS' office samples of Wilson & Silsby fabric. These have attracted considerable attention, and show already evidence thereof, with sample pieces cut out here and there by enthusiastic builders.

W. C. Durgan, of 115 Brown St., Syracuse, N. Y., has installed an exhibit of Curtiss and Demoiselle laminated ribs. These are exceedingly well made and the makers deserve the patronage of those who have use for such ribs.

Another exhibit is of "Ambroid" glue and varnish, made by the West Mfg. Co., 350 Broadway, New York.

Rubel Makes Motor.

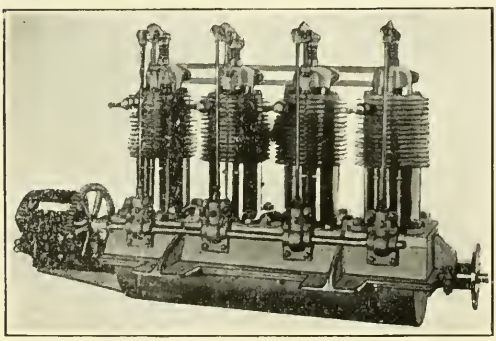
After nine months of continual hard testing, the "Gray Eagle" aeronautical motor has been placed on the market by R. O. Rubel, Jr., & Co. of Louisville, Ky.

Many things of interest could be said about this particular motor. Its strongest points to be considered are the liberal 14 in. of bearings on the crankshaft and its large concentric valves.

Unlike most air-cooled motors, the "Gray Eagle" is capable of continually running without overheating. Although the general design follows that of successful automobile motors, it has several features not found on other types of aeronautical motors.

It is a four-cylinder, 30-40-horsepower air-cooled engine of the four-cycle type, having a bore and stroke of 4¼ by 4½ in.

The large overhead concentric valves designed and patented by R. M. Roof, M. E., are somewhat similar to the well-known air-cooled Franklin automobile motor.



"Gray Eagle" Air Cooled Motor.

Much of its success is attributed to these concentric valves, which are in size nearly as large as the bore of the motor. This facilitates cooling and increases the actual horsepower. The intake valves are made of nickel steel, with electric-welded valve stems, and the exhaust valves are made of a special cast semi-steel.

The cylinders are machined on the inside and outside from a solid 30 per cent carbon ingot. Each cylinder casting weighs 55 pounds and is carefully machined to a net weight of less than 11 pounds. Turning each cylinder from a solid cast ingot of steel insures an even radiation of heat and cylinder walls of uniform thickness. This is the method of manufacture that the celebrated Gnome air-cooled motor follows.

The crankcase consists of two aluminum alloy castings with under-pan, which is easily removed, allowing a rapid examination of bearings or adjustment.

The four-throw chrome nickel-steel crankshaft runs in five large bearings. These bearings are made of a high-speed nickel alloy, measuring 14 in. in length.

The "Gray Eagle" motor is equipped with Bosch high-tension magneto, Schebler carburetor, force-feed oiler, Bosch plugs, terminal and oil tank.

The makers expect to build not less than 75 of these motors during this year, and have reduced the cost of manufacturing to such an extent that the complete motor with equipment will be sold at $485.

A thrust of 210 pounds to 250 pounds is guaranteed with an expanding pitch propeller and the motor is fully guaranteed for one year.

Although the weight of the radiator, water and pump are eliminated, the "Gray Eagle" motor was designed for hard use and abuse such as they are likely to receive in the hands of amateur aviators, and their net weight of 178 pounds compares well with any motors of the same horsepower. At the present time all of the endurance records are held with air-cooled motors.

By using an air-cooled motor, the inconvenience and weight of water, besides the reduction head resistance, makes it a desirable featur.

School for San Francisco.

The California Aero Manufacturing and Supply Co. of San Francisco have moved to new and larger quarters at 781-3 Golden Gate Ave., where they now have two floors, 50 by 120 each, and will be fully equipped to handle and build machines of any design. A large machine shop, forges, etc., have been installed, and preparations are being made to install an aero school in conjunction with an automobile school. The course will consist of training in the construction of gliders and ordinary types of machines, such as the Curtiss and Bleriot and actual flying practice on grounds which they are now negotiating for.

S. Doi, a Japanese of San Francisco, is constructing a biplane of original design. He is using "Camasco" material throughout. A description of his machine will shortly appear in AERONAUTICS.

John W. Hamilton of San Francisco is building a Bleriot No. 11 monoplane, which is remarkable for its fidelity to the original. It is neat and well made. He will use a 40-60 Elbridge Aero Special.

C. E. Fredrickson of San Francisco is building a biplane on original lines. He will use a two-cycle motor of his own design.

The California Aero Manufacturing and Supply Co. reports the sale of two 1911 Aero Special Elbridge engines, one to John W. Hamilton and one to the Diamond Aeroplane Co. Both orders were taken inside of a week. They also report the sale of two Detroit aero motors. The demand is good for standard materials, such as Requa-Gibson propellers, Goodyear tires and cloth, stranded aero cable, which they carry in stock.

Wolverine Two-Cylinder Motor.

The Wolverine two-cylinder opposed air-cooled aero motor was recently placed on the market by the Wolverine Aeronautic Co. of Albion, Mich.

The design is extremely simple, and, having only two cylinders, makes it possible to produce a light-weight motor which is at once economical in fuel consumption, strong, powerful and can be relied on to deliver its full rated power continuously.

The bore is 5½ in., stroke 5 in., horsepower 25 to 30, depending on the speed; weight 130 pounds.

The motor sells complete with battery ignition, Schebler carburetor, a 7-ft. spruce and

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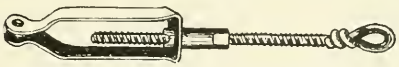

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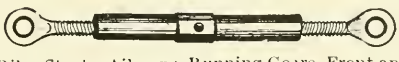

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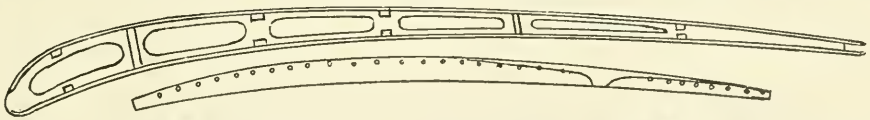

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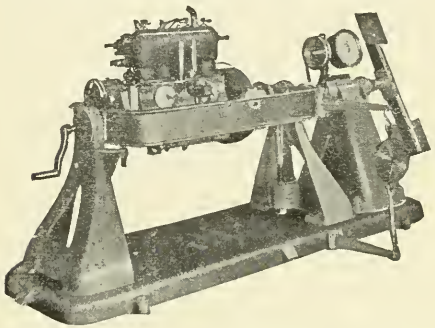

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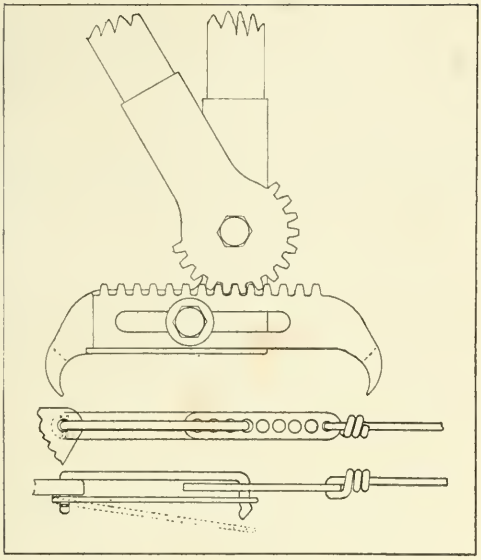

Wolverine Turnbuckle and Tool.

oak laminated propeller, for $350, guaranteed to deliver 220 pounds thrust at 1,000 r. p. m. Bosch magneto, $50 extra.

The company also manufactures propellers and aeroplane parts, both wood and metal. One is a special wire tightener and tool for applying same, which does away with turnbuckles and enables the wires to be quickly connected or disconnected or tightened as much as desired. The tool sells for $3 and the tighteners 8 cents each.

They make propellers from several kinds of wood and sell for different prices, the highest being spruce and mahogany, laminated and highly finished with rubbing varnish, 6 and 7 ft., any pitch, $40. The lowest-priced is made from oak and white wood, finished with shellac, 6 and 7 ft., any pitch, $25.

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Dean Six-Hour Test.

Lieut. John Rodgers of the United States navy was present at the factory of the Dean Manufacturing Co. April 9 to witness a six-hour endurance test of a four-cylinder 4¾ by 4¼ Fox De Luxe aero motor, 60 horsepower. The motor was started at 10 a. m. and shut down by Lieutenant Rodgers, who wrote as follows:

"At 4.06 p. m. I shut down the Fox De Luxe four-cylinder motor (aero, 60-80 horsepower, No. 3645), after witnessing a six-hour run, during which time the engine ran at a speed of between 1,200 and 1,300 r. p. m. At the end of the run the motor was cool, in good condition and ready to start up again."

Following this test a special half-hour run was made at 1,450 revolutions to give the exact gasoline consumption at this speed.

Fully 100 people witnessed the test, and there were 18 present at the starting.

A full account of this test will be sent by the manufacturer upon application to parties who are interested in aero motors by writing to the Dean Manufacturing Co., Newport, Ky., who manufacture a line of 22 sizes of marine and aero motors.

The aeronautical booking office and exchange for new and unused aeroplanes and supplies, is the latest development. The Aero Clearing House of 299 Broadway, New York, has for some time been working up a booking business, and they state now that they are booking the Rex Smith, the Kirkham-Eells, the Thomas aeroplanes and Ladis Lewkowicz, the Russian aviator.

These men are being placed on a no-flight-no-pay basis; the local people are required to put up a cash guarantee sufficient to cover expenses, and in case bad weather prevents flights during the week, a bonus of about one-half the guaranteed money; then the flights are charged for by the day, gradually growing less, in proportion to the length of the engagement. The men are being placed at prices from $1,500 to $3,000 for the week.

Two or three good aeroplanes are for sale, both foreign-made Bleriot and American-made biplane types. There are many demands for motors, but only a few write that they have motors for sale.

The concern states:

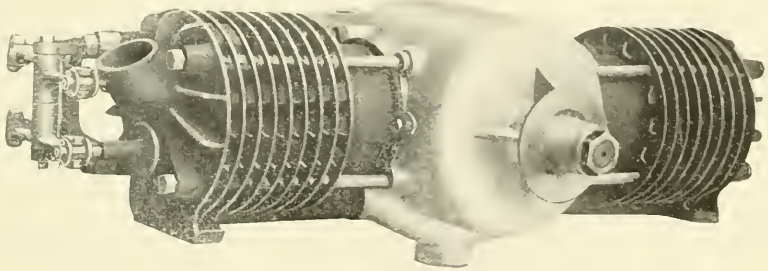
"We have just completed arrangements with the United Fairs Co., the fair department of the United Booking Offices of America, by which we furnish them all the aeroplanes they use for their exhibition work this year and in return by which we give them exclusive rights on all the fair territory east of Cincinnati.

"There are a number of Western dates coming in, and we are now negotiating with some Western aviators to take care of that territory, so as to prevent any long jumps for our eastern men."

The Goff Aeroplane Co. of Chicago have been appointed Western agents for the Rinek Aero Mfg. Co., makers of the Rinek engines.

A branch office of the Goff Aeroplane Co. has been opened in Milwaukee at 558 Jefferson St. in the Studio Building. Mr. A. Gundelach has been appointed manager.

The new catalogue of the Goff Aeroplane Co., 219 S. Dearborn St., Chicago, Ill., is surprising as showing the extent to which the model-making business has reached. Everything necessary for building of models is listed. In addition, this concern has models ready built at but 30 cents each, postpaid.



New Wolverine Engine

Carl Chapman of the Kalamazoo Aeroplane Co. has a new monoplane ready for the field. He has installed one of the 1911 models Elbridge Aero Special engines.

Five machines have flown at Mineola so far this year, and three of them were equipped with Elbridge "Featherweight" engines. The engines were 1910 models in use for a year or more, but all gave good results.

With more than 300 machines building in the vicinity, Philadelphia promises to have an active season in aviation. Carman & Bowes, Bourse Building, the Philadelphia representatives of the Elbridge Engine Co., report a number of orders and much interest in the new "Aero Specials."

J. N. Sparling of the Sparling aviators, East St. Louis, bought his third Elbridge engine a few weeks ago and has already ordered a fourth.

Acting on the advice of J. J. Frisbie, Lieut. A. F. W. McManus of San Antonio will install a more powerful motor in his monoplane. He has ordered an Elbridge 40-60.

Tom Gunn, said to be a representative of the Chinese navy, has arrived in New York from Oakland, Cal., to take up some work at the Aeronautic School of Engineers, 312 W. 52d St., New York.

The school has built three machines now, genus Curtiss. Both, equipped with Elbridge engines, will be at Mineola before the 1st of May. One is a two-man machine. The chassis of an electric automobile has been used as a running gear for one machine, which will be employed as a "grass-cutter," in which the students will run over the ground, learn the sensations of bumping along the handling of the engine, etc.

Arthur Maynard, a student from Holyoke, Mass., has completed a course and has taken to his home town a Curtiss type machine, which he built at the school. Two Demoiselles are being built and a Detroit Aeroplane Co. two-cylinder 1911 motor is on hand for installation in one of these. A contract has been made with the Goodyear and El Arco radiator people to use their material as standard equipment. The school is now controlled by Frank Fitz Simons, Frank J. C. Ferris and Henry J. Winter.

Andy Brott, the Denver aero engine builder, has already shipped one of his engines to Toledo, O. (eight cylinder), and is just completing his second (four cylinder), which is to go to Seattle, Wash. His motors are water-cooled, V type, and seem to give results. Mr. Brott will not say to whom the motors are shipped.

The Walters engine, which is built by Guy & Walters of Denver, is to be tried out on Mathewson 'plane No. 2 in competition with the Elbridge. As yet he will give out no details. E. Linn Mathewson, financier of the Mathewson Aeroplane Co., who reported he was to open an aero school, may not do this. Mr. Mathewson does not know whether he can spare his aviator, George Thompson, and helper, George Van Arsdale, for this kind of work. He will decide this very shortly.

ROBERT A. DONALDSON.

Glenn Curtiss has now taken up Goodyear fabric, the Army machine using the number seven. The detachable tires made by the Goodyear Company are being used by Curtiss, Walker and Robinson.

The Chicago Aeroplane Manufacturing Co., 2232 Cottage Grove Ave., Chicago, Ill., has a large number of students taking their practical course in actual construction of aeroplanes. A 28-ft. Curtiss type machine has been completed, to be equipped with a Boulevard motor, and another is being started. Eight are expected to be finished this summer. The students have outdoor work and learn to fly. A correspondence course is also conducted under the charge of W. J. Jackman, A. B., M. E.

The opening of spring has brought a great impetus to aviation—both manufacture and exhibition. Ample evidence of this is furnished by the Glenn H. Curtiss offices in this city, where increased space has been taken to accommodate the growth of business. Twice within the year the Curtiss offices at 1737 Broadway have been moved into larger quarters in the same building.

Jerome Fanciulli, general manager of both the Curtiss Aeroplane Company and the Curtiss Exhibition Company, announces that the Exhibition Company has already made contracts for exhibitions aggregating $200,000, covering the period from April to October. The prospects for sales of aeroplanes are also very bright, and Mr. Fanciulli reports a number in hand for May and June delivery.

"There is great interest in aviation this spring," said Mr. Fanciulli, "and this year promises big business. Aside from our extensive bookings for the summer and fall throughout the country for our eight aviators, there are many inquiries from those desiring to purchase aeroplanes. This is proof that the wonderful strides in flying by aviators is fast convincing the public that the aeroplane is no longer a toy, but a practicable machine, safe and serviceable. I believe we are just on the eve of great activity, such as now exists in France, and that the coming summer will witness some wonderful performances in flying.

"Mr. Curtiss has just returned from San Diego, Cal., where he carried on his experiments and the training of five military officers during the winter, and is now at his factory at Hammondsport, N. Y. He will devote himself entirely to experimental work, with an occasional exhibition flight in his new hydro-aeroplane. This machine will prove to be the biggest development in aviation in recent years. It will be a great thing for beginners, as it reduces the danger of accidents and enhances the pleasure of flying by making lakes and rivers available for aviation fields."

Mr. Fanciulli has been with Mr. Curtiss ever since the Hammondsport manufacturer returned from Rheims, France, where he won the first international cup for America. Before entering the business side of aviation, Mr. Fanciulli was one of the star men for the Associated Press at Washington, being attached to the Capitol staff, where his work in reporting the proceedings of the House gave him a wide acquaintance with the public men of the country.

He brought great energy and executive ability into the aviation business, and has been most active in keeping Mr. Curtiss and the Curtiss aeroplane before the people of the United States. Through his personal efforts and under his management, the first aviation meet in New York to prove financially successful was pulled off under the Curtiss auspices at Sheepshead Bay last summer, and his exploitation of the Curtiss machine, with the resultant sale to the Government and the excellent reputation of the Curtiss flyers, is evidence of the value of good advertising and publicity.

The executive staff of the Curtiss Exhibition Company in this city numbers eleven persons, and those of the Aeroplane Company five. Included among the former are Mr. E. D. Moore, formerly night manager of the Associated Press in New York, who is in charge of the publicity work; Thomas T. Tuttle, a well-known young newspaper man; A. L. S. McCurdy, brother of the noted aviator, road manager, and J. K. Lockwood as Mr. Fanciulli's secretary.

Among the noted aviators on the Curtiss staff are Eugene Ely, J. A. D. McCurdy, J. J. Ward, Lincoln Beachey, H. A. Robinson, C. C. Witmer and R. C. St. Henry. The last two are new men, but as they were thoroughly trained by Mr. Curtiss himself at San Diego, they are expert flyers.

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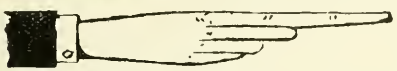

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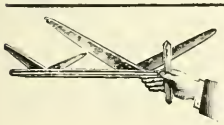

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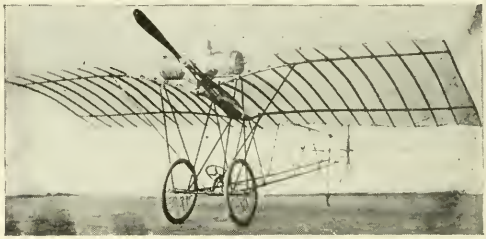

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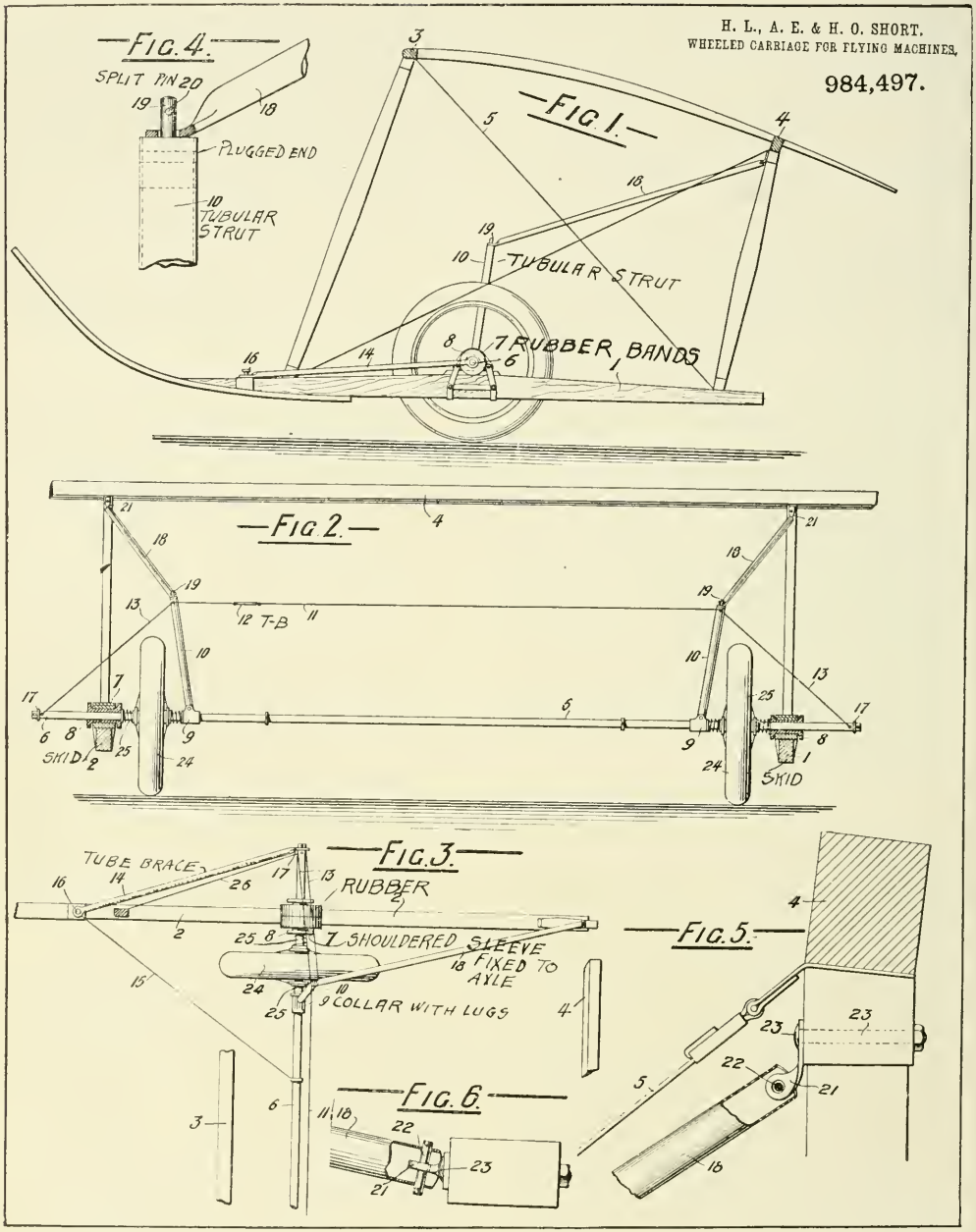

Albert H. Friedel, 984,270. Filed June 23, 1909. "Patent covers a flexible leading edge. Forward of the usual front lateral beam open aeroplane. Introduces a rotating combination horizontal and vertical wing tips or extensions to wings for increasing or diminishing the lift of either side, thus affording a means of securing later equilibrium. These produce a downward pressure at one side of the aeroplane and an upward one on the other.

Henri Peuvot, Paris, France, 984,295, Feb. 14, 1911. Filed June 14, 1909. "KITE." Flexible plane surface, cellular system attached, bracing, etc.

R. W. Stewart, Oakland, Cal., 984,311, Feb. 14, 1911. Filed Feb. 15, 1910. "AERIAL MACHINE. Claims cover combination of a series of following, laterally offset integral sections arranged in echelon formation; propeller between rear following sections; balancing planes adjacent to the lateral sections, tail planes and rudders.

Horace L. Short, Albert E. Short and Hugh O. Short, Battersea Park, London, England,

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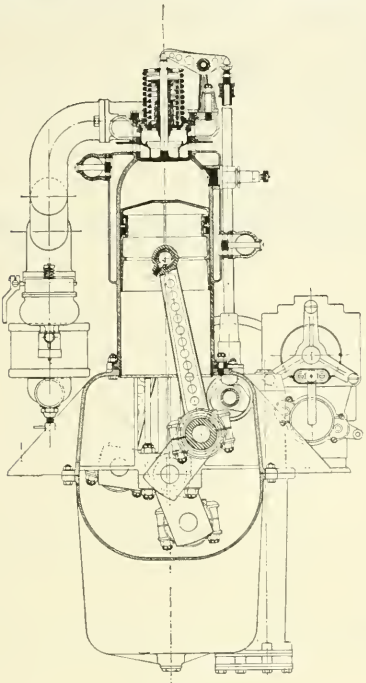

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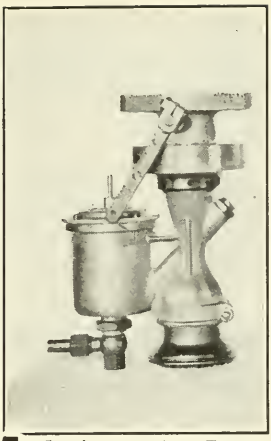

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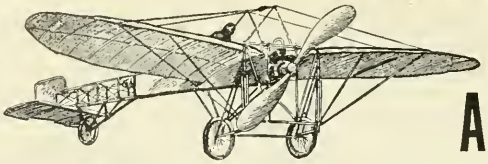

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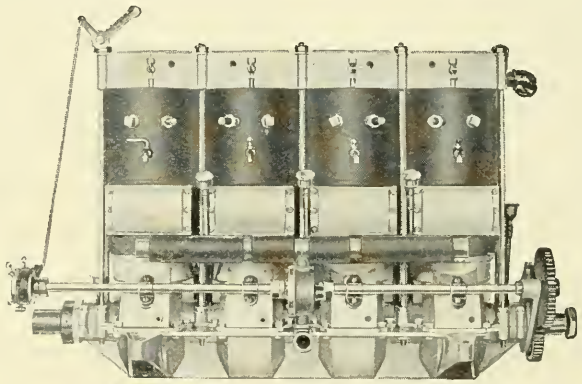

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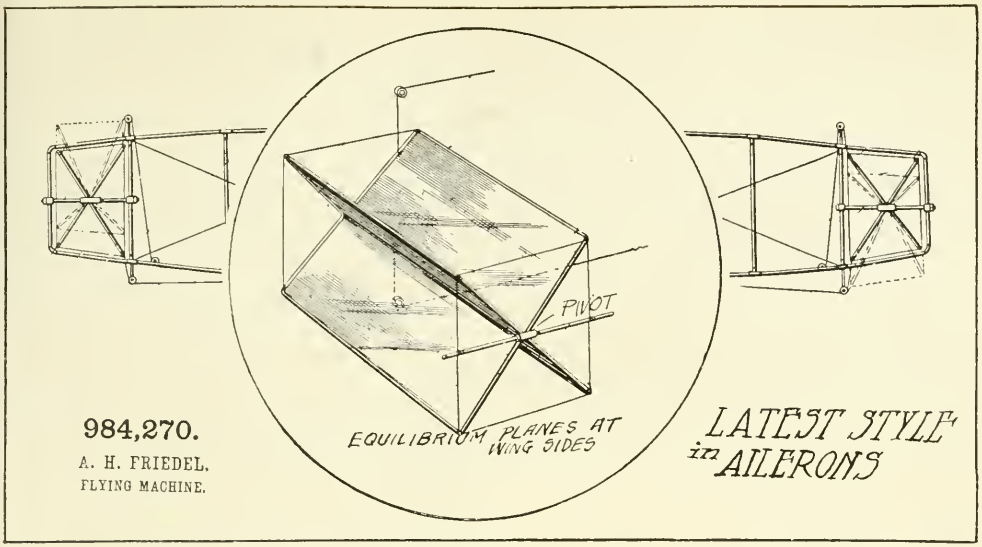


984,497, Feb. 14, 1911. Filed July 28, 1910. "WHEELED CARRIAGE FOR FLYING MACHINES." Claims cover the combination with paralelly arranged skids [1, 2] extending longitudinally, and framework connecting same to flying machine; tubular axle 6, extending transversely over and laterally beyond said skids, means for resiliently connecting axles to upper surfaces of skids and permit upward motion of axle 7, wheels carried and freely revoluble and capable of endway motion, locating of one wheel adjacent to the inner face of each skid, means for resiliently limiting the endway motion of each wheel upon axle, a vertically extending strut 10 adjacent to each wheel, means for connecting the lower ends of axle struts to axle, a collar 9, fixed on the axle adjacent to each wheel, means for connecting the lower ends of axle struts to axle or to collars, a tie 11 connecting upper ends of axle struts and extending to and connected with outer ends of axle, means 12 for tensioning same, rearwardly extending struts 18 connecting flexibly or otherwise the upper ends of axle struts to the rearward framework of skids to maintain axle struts approximately vertical, means for flexibly connecting the forward ends of upper struts to the upper end of axle struts [Fig. 4] and for connecting the rearward ends of said upper struts flexibly to skid. Framework [Fig. 5] and stays 14-15 connected to axle and extending and connected to the forward portion of skids to support axle against rearward motion; rigid stay flexibly connected to and extending diagonally from each outer end of axle forwardly to the respective skid adjacent to axle end, means for flexibly connecting the forward end of rigid stay to skid, and a flexible diagonally extending tension stay for each end of axle connected to skid at one end and to axle at its other to support axle against rearward motion.

John W. Hearst, Oakland, Cal., 984,667, Feb. 21, 1911. Filed March 17, 1910. "STORAGE BATTERY ATTACHMENT FOR AIRSHIPS."

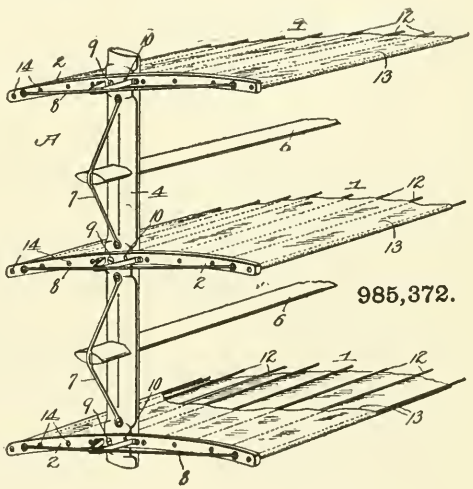
W. B. Luce, Hingham, Mass., 984,683, Feb. 21, 1911. "TOY FLYING MACHINE."

John W. Hearst, Oakland, Cal., 984,812, Feb. 21, 1911. Filed Jan. 15, 1910. "PROPELLER WHEEL FOR AIRSHIPS." Hub, blades extending therefrom to a run.

James A. Horne, Portland, Ore., 985,034, Feb. 21, 1911. Filed April 14, 1910. "FLYING MACHINE." Biplane with the upper surface in sections each mounted on a pivot running fore and aft. Normally these sections stand vertical. A crank operates all those on one side together and by movement thereof causes all on one side to lie horizontal giving lift on that side of the machine by making virtually a plane horizontal surface. Propulsion is by a paddle wheel arrangement.

E. K. A. Baumann, Stuttgart-Oberturkheim, Germany, 985,126, Feb. 28, 1911. Automatic longitudinal and lateral STABILITY.

James Rooney, Croton, N. Y., 985,372, Feb. 28, 1911. Novelty in CONSTRUCTION for lightness and small resistance.



James Rooney, Croton, N. Y., 985,373, Feb. 28, 1911. Means for WARPING and tilting planes.

A. W. Schaef, Wellington, New Zealand, 985,375, Feb. 28, 1911. In an aeroplane, the combination with the main frame thereof, of a horizontal rear plane pivoted at its rear end to the main frame and overhanging the same for elevation and depression, and a vertical rudder plane disposed over said rear plane and pivoted at its end to the rear part thereof for lateral shifting in relation to said rear plane and being adapted to move up or down with the rear plane.

M. B. Dunkle, Moscow, Idaho, 985,665, Feb. 28, 1911. Device for allowing planes to automatically change their angles of incidence, together or separately, to provide STABILITY.

David Smith, Deverre, Nebr., 985,849, March 7, 1911. Manually operated OSCILLATING WINGS.

John H. Nolan, Boston, Mass., 985,925, March 7, 1911. HELICOPTER.

Karl Hipssich, Bremen, Germany, 986,002, March 7, 1911. Shape and arrangement of planes to preserve STABILITY.

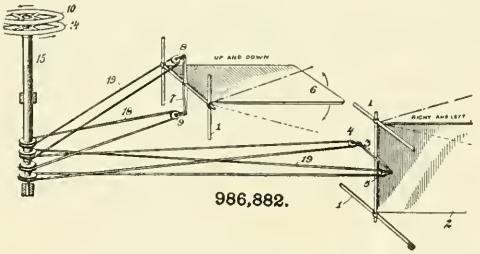
H. Mitchell, St. Paul, Minn., 986,195, March 7, 1911. Pendulum-operated STABILITY device.

Henry W. Yost, Springfield, Ohio, 986,258, March 7, 1911. HOLLOW LAMINATED POSTS.

Melvin D. Compton, New York, 986,364, March 7, 1911. Flying machine in which wings consist of a frame inclosing SHUTTERS which open and close mechanically.

Wm. H. Harrison, New York, 986,418, March 7, 1911. Flying machine using JET PROPULSION.

James O. Brookbank, Driftwood, Pa., 986,431, March 14, 1911. DIRIGIBLE.



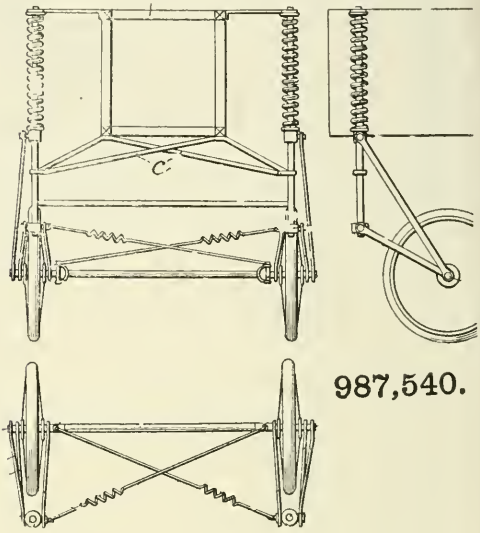
986,882.

Charles A. Kuenzel, Buena Vista, Colo, 986,579, March 14, 1911. DIRIGIBLE.

Ernst Werndl, Pyrach Post Garsten, near Steyr, Austro-Hungary, 986,882, March 14, 1911. STEERING GEAR.

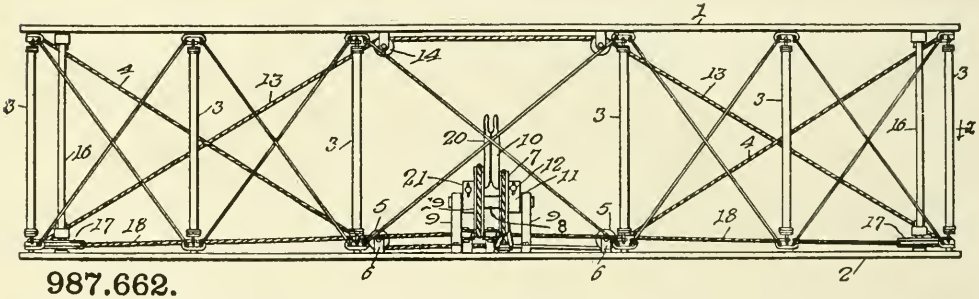
Charles A. Kuenzel, Buena Vista, Colo., 987,380, March 21, 1911. Improved suspension, direction, etc., of a DIRIGIBLE.

Harold M. DeGraw, Camden, N. J., 987,439, March 21, 1911. Means for varying the wing flexure of an aeroplane and connecting wing warping or ailerons with the rudder for obtaining STABILITY.



987,540.

Louis Bleriot, Neuilly-sur-Seine, France, 987,540, March 21, 1911. Filed Jan. 11, 1909. Flexible system of RUNNING GEAR, as used on all Bleriot monoplanes.



987.662.

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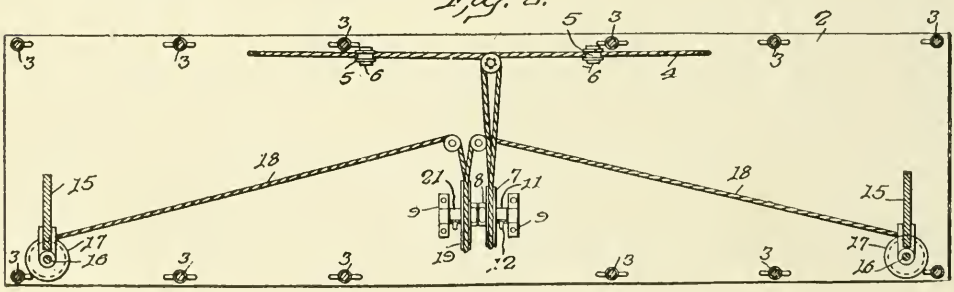
Fig. 2.



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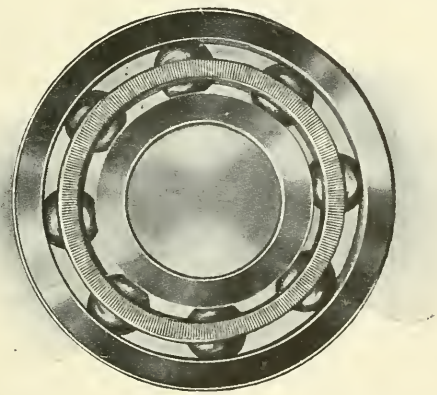

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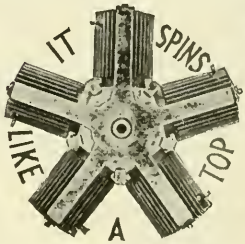

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Self cooled by its own revolution

THE ADAMS COMPANY
DUBUQUE, IOWA, U.S.A.

Johann Schutte, Langfuhr, near Danzig, Germany, 987,178, March 21, 1911. DRIVING MECHANISM for DIRIGIBLES.

M. A. Parisano, New York, 987,596, March 21, 1911. Cylinder with propellers in side, outspreading wings from sides of cylinder.

Frederick Hansen, Stratford, Ont., Can., 987,624, March 21, 1911. Novel PROPELLING MECHANISM, usable for steering.

Orville and Wilbur Wright, Dayton, O., assignors to the Wright Co., of New York, 987,662, March 21, 1911. Filed Feb. 17, 1908. The object of the invention is to maintain LATERAL BALANCE by horizontal surfaces adjustable to different angles of incidence on right and left sides of the center of the machine, in combination with adjustable air-resisting surfaces on the right and left sides of the center of said machine, and means for controlling either, separately or in conjunction.

In order to compensate for the unequal resistance to advance when the planes are warped, vertical rudders or vanes 15 are arranged at each side of the machine. These vanes are actuated by cords 18, which pass over pulleys and around the drum 19, provided with a lever 20 and friction clamp 21. The handle 20 extends parallel and close to handle 10 which warps the planes, so that both may be grasped in one hand and both operations made simultaneously. When the lever 20 is moved in one direction one vane takes the desired angle to the line of travel and, the other end of the cord being slack, the opposite vane is free to take a position parallel to the line of flight.

This new patent closely follows one allowed in England Nov. 10, 1908 (No. 24,077), filed Nov. 18, 1907.

PATENT COVERS AILERONS.

That the Wright Brothers had in mind what are now called "ailerons" is shown by the following paragraph:

"It is to be furthermore understoood that while the horizontal adjustable surfaces are herein shown as composed of integral portions of the main aeroplanes themselves, they may be otherwise constituted. And so also the resistance surfaces 15 may be otherwise constituted without departing from the spirit and contemplation of our invention. It will also be understood that while the invention is here shown as applied to a biplane it is equally applicable to any flying machine comprising one or more aeroplanes. It will, likewise, be understood that the words 'horizontal surfaces,' 'adjustable horizontal surfaces' and the like, as used in the specification and claims, refer to adjustable wings or lateral surfaces which effect lateral balance, irrespective of whether or not the adjustable surfaces are formed integral with the supporting surface."

C. H. Cornelius, Fresno, Calif., 987,796, March 28, 1911. Assignor of one-half to James Warrington, Fresno. Monoplane with means for changing the area, and to assume a parachute-like condition in descending.

Joseph Ostand, Cincinnati, O., 987,819, March 28, 1911. Gas-supported apparatus with parachute attachment.

Wm. J. Craig, Belvidere, Ill., 987,963, March 28, 1911. BOX KITE.

J. J. Slavin, Los Angeles, Calif., 988,039, March 28, 1911. AUTOMATIC STABILITY device, supplementary surfaces, each movable by action of the air on the others individually through a plurality of pistons.

Charles Kramer, North Braddock, Pa., 988,113, March 28, 1911. Superposed oscillating planes on aeroplane, former connected on the principle of lazy tongs.

Edward B. Latch, Merion, Pa., 988,115, March 28, 1911. Utilization of the head wind in raising a dirigible.

Preston A. Watson, Dundee, Scotland, 988,415, April 4, 1911. Rigid, non-warping plane above main plane of aeroplane, movable about its longitudinal axis.

J. K. Toles, Stockton, Calif., 988,523, April 4, 1911. HELICOPTER.

ARMY AVIATORS AT SAN ANTONIO.

On April 18 Lieuts. Beck, Kelly and Walker, of the U. S. Army, took up duty at San Antonio. Eugene Ely, Curtiss aviator, officially delivers the Curtiss army machine and demonstrates it for acceptance by Major Geo. O. Squier, Chief Signal Officer of the Maneouver Division, U. S. A.

The military and naval aviators who have learned during the last winter to fly aeroplanes are as follows: Lieut. John Rodgers, U. S. Navy, who learned at the Wrights' Dayton camp; Lieut. Theodore G. Ellyson, U. S. Navy, and Lieuts. Paul W. Beck, G. E. M. Kelly and John C. Walker, Jr., U. S. Army, who took their training at the Curtiss camp at San Diego.

Lieut. B. D. Foulois and Lieut. Frank P. Lahm, both Wright operators, are the other two army aviators. Lieut. Lahm is not doing aeronautic duty at this time. Lieut. Foulois, as is well known, has been flying the Wright machine loaned the Government by Robert J. Collier.

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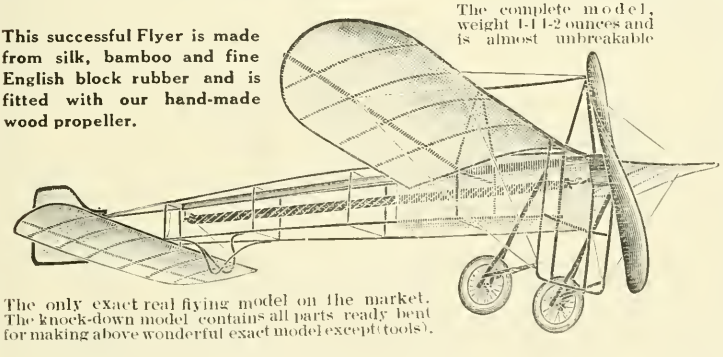

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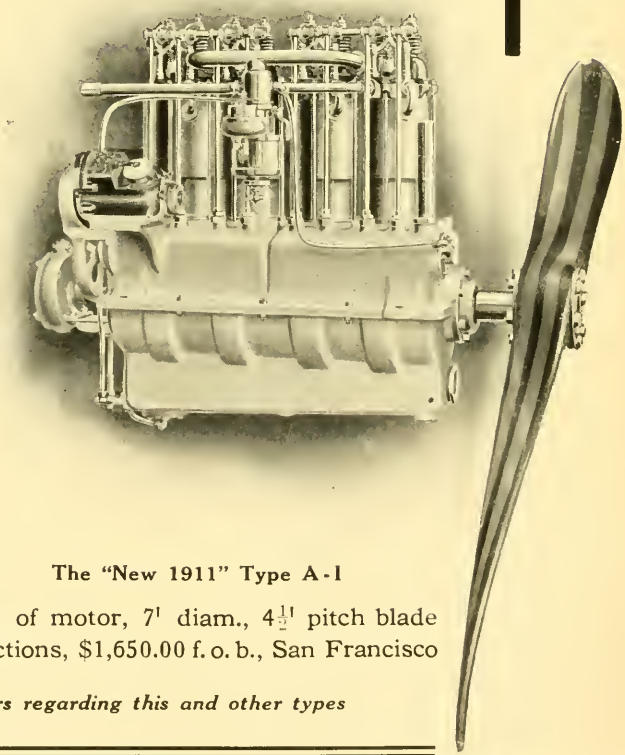
Its absolute simplicity of design, accessibility to parts, ease of adjustment and light weight, particularly adapt it for use of beginners in aviation as well as for professional work in lighter type machines.

Motor complete, with Mea-Magneto, carburetor, oil and water pumps, $1,500.00 f. o. b., San Francisco.



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Vol. VIII, No. 6. JUNE, 1911 Serial No. 47

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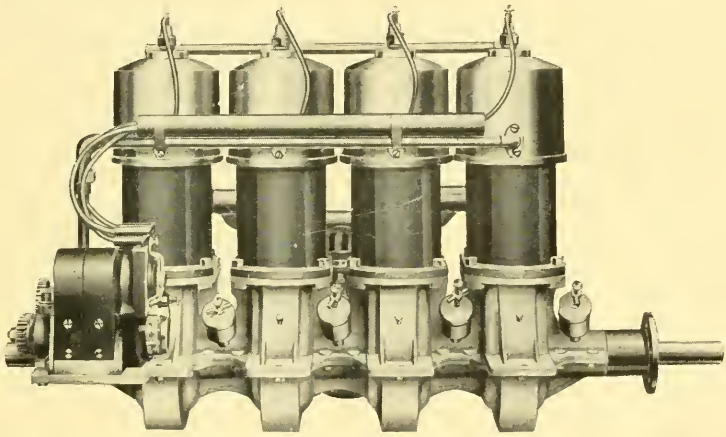

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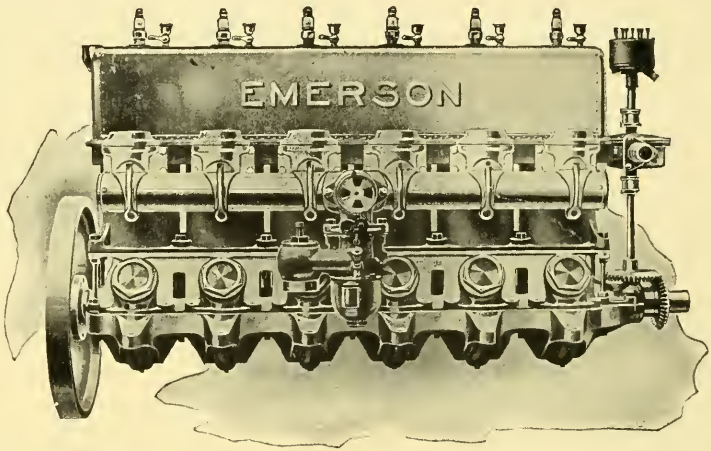

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American Propeller Company,
Washington, D. C.

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Beg to advise you that I received the 7' 9" propeller which you sent me and that the results obtained with the same are most gratifying.

To anyone contemplating the purchase of a propeller you may quote me as saying that I consider "Paragon" propellers the synonym of perfection in propeller construction at this date. You may rest assured that I will give you the order for the two propellers on the passenger machine which I am now building.

Thanking you again for the courteous attention and promptness with which you have made deliveries, I beg to remain,

Sincerely yours,
Chas. F. Willard

Mr. Willard telegraphs—"Standing thrust 390 pounds at 1100 revolutions, hard wood screw on Gnome engine (7¾ feet diameter by 5.70 foot pitch)."

Mr. Curtiss telegraphs—"Propeller developed as follows: No. 2 (7 feet diameter by 5.75 pitch) 360 pounds thrust at 1200 R. P. M.; No. 3 (7 feet diameter by 6.20 pitch) 350 pounds at 1100 R. P. M. No. 2 very satisfactory in flight and probably nearest correct. Ship 7 foot 6 by 7 pitch to Belmont Park for Gordon-Bennett racer."

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AERIAL MOTORS OF TO-DAY

By George S. Bradt,

TREASURER OF THE AERONAUTICAL SOCIETY.

SO far as aeronautical motors are concerned, aviation owes much to the advent of the automobile, which has pretty thoroughly sifted out the weak and impractical points in the construction of the internal combustion motor.

When we first began to run automobiles, the motors that were installed at that time were only supposed to give good service for, say, 1,500 or 2,000 miles, when they must be discarded and termed worn out, while at the present date it is not uncommon to have an automobile motor run and give good service for 50,000 or 60,000 miles and still have quite some usefulness left in it. Thus it is safe to state that had the rest of the component parts of an aeroplane had the benefit of as much experience as the motor, we would at this date no doubt be much further advanced than we are as to the stabilizing of planes, sustension aeras and propulsion through the air in heavier than air machines.

The manufacturers of aerial motors up and until the present time have seemingly had a craze to turn out a very light weight motor, so much so, that in fact in many instances it has been carried to extremes, and strength has been sacrificed to obtain a light weight motor, which in the end has been found to be entirely impractical. This is radically wrong, and that it is wrong is not only proven in theory but in actual practice. For instance, the Wright brothers, who probably have done more than any other individuals to further the art of human flight, have always used a motor of about the type of the ordinary automobile motor, which weighs nearly 8 pounds to the horse power.

As to the requirements of the aeronautical motor, the use and abuses it is subjected to are, in nearly every instance, many times more severe than that of the automobile motor. The motor of an aeroplane is usually run at its maximum capacity, or nearly so, and must continue to do so for long periods, while the automobile motor is rarely ever run at its highest efficiency unless in a contest, but for the ordinary and average use is run at about one-fourth of its maximum delivery of power.

As to the superiority of the 2 or 4-cycle type of motor, we have the same old wrangle. Both have their steadfast supporters, and both have their mechanical advantages as well as their disadvantages. Points claimed in favor of the 2-cycle type are such as "less vibration, due to the fact of a power impulse delivered to the driving shaft at every revolution of the crank; on this account the base, bearings and crank-case can be built lighter, as the continuous application of power impulses at each revolution does not throw so much stress and strain on them as a 4-cycle motor does. Also the fact that it has no valves, and thus requiring no cam-shaft, which does away with many moving parts in its operation."

Some points in disfavor of the 2-cycle type are as follows: "The crank-case is at all times filled with vaporized fuel, thus occasioning great care to have it air-tight. The lubrication of the bearings is effected by mixing lubricating oil with the fuel. In some instances manufacturers advise 1 pint of lubricating oil to each 5 gallons of fuel."

As to the intake and exhaust of the 2-cycle type, these two functions are effected by ports in the cylinder, which are opened and closed by the movement of the piston as it travels up and down, and our best experts do not agree as to whether or not the cylinder or combustion chamber is thoroughly cleansed of the old burnt charge before it begins to perform its work upon the new one.

The foreign makers of 2-cycle motors have gone a step further and added some valuable features which seem very practical. It has always been contended that while a 2-cycle motor (delivering an impulse to the crank at every revolution) ought to produce twice the horse power as that of a 4-cycle type of the same dimensions, yet it does **not,** and it is claimed that one of the principal reasons is that a certain per cent. of its efficiency is lost by reason of the fact that when the port is opened for fuel to pass into the combustion chamber, the movement is so rapid, with the moving parts also performing other functions at the same time, the chamber is not filled with new and fresh fuel to its full capacity. The foreign makers have placed a pump at work on the fuel line, so that when the port is opened a full complement of fuel is forced into the chamber. One of the motors having this feature is the "Lamplough," which is manufactured expressly for aerial work. Another peculiar feature of this motor is the fact that it has two pistons to each cylinder. Another foreign 2-cycle aerial motor is a product of the New Engine Company, known as the N. E. C. Mort. Here the makers have so constructed their cylinders that when a charge of fuel has been fired and the power stroke spent, a poppet valve lifts and a puff of air is forced through the cylinder, thus thoroughly cleansing the chamber before it starts upon its work of compressing and firing the new charge.

Among the favorable points of the 4-cycle type of motor is the claim of less fuel, due to the fact that it only delivers an impulse to the crank at every other revolution of the shaft, and experts agree that the 4-cycle type does secure a more perfect combustion because it takes four distinct actions and two revolutions of the crank to deliver one power stroke to the driving shaft, and therefore has twice the time in which to perform its work that the 2-cycle type has.

As to vibration, stresses and strains in the 4-cycle type, there is no doubt that in this there is more than in the 2-cycle, yet with the 4-cycle motor when four or more cylinders are used, the vibration is greatly diminished, and especially in the 6 and 8-cylinder types where the power impulses overlap one another.

The 4-cycle type seems to afford better means of lubrication than the 2-cycle does.

During the past, and even at the present time, the constructors of planes, in many instances, know very little about motors. They heedlessly rush into the matter without exercising due care in the selection of the motor, which is really the heart of an aeroplane, for no matter how carefully you may construct and work out the details of your plane, if your motor is faulty, then your plane is sure to be a failure. More failures and discouraged constructors of aeroplanes at this date can be attributed to motors that, which while sold for aerial work, were not adapted to it at all, than can be ascribed to faulty planes.

In the selection of a motor for our plane, what are the chief points to be considered? First, we are called upon to ascertain whether the manufacturers of the particular motor in question have been constructing aerial motors for some time, or whether they are still in the experimental field, as it is a well-known fact that some of the present-day motor manufacturers seem to prefer to make their experiments at the cost of the consumer. Another important point to discover is whether the bearing surfaces for all moving parts of the motor are ample or not, bearing in mind that while a heavier bearing is not necessarily needed, yet more bearing surface is needed in an aerial than in an automobile motor. Having satisfied yourself as to the type of motor in general, bearings, bore, stroke, aera of valves and their manner of operating, there are still three very important points to be considered, as they pose to make your motor a success or a failure. These three points are lubrication, ignition and carburetion. And a

purchaser is called upon to scrutinize and examine most carefully these three points of a motor he contemplates purchasing, as all or any one of the three being faulty will make the motor a failure.

Let us touch briefly on these points, taking first lubrication. The best and least complicated system now in use is the one known as the dual system. In this type of oiling, the lower inch or inch-and-a-half of the crank-case is a separate compartment, and is an oil reservoir with a small gear pump to force the oil from this reservoir direct to the bearings by leads. Thus it first lubricates the bearings, and then drips down into the crank chamber, and is contained there, producing the splash system, until it reaches a proper height, when, through overflow pipes, it trickles down and into the reservoir from whence it first started. This is indeed an excellent and reliable system, as it enables you to carry, as a part of your motor, 1 or 2 gallons of oil, and if for any reason the gear pump should fail (which is not likely), you are still in possession of the splash system, which some motors rely upon solely, and which would carry you many miles before the motor would suffer for the want of lubrication. Sight feed is used to enable the operator to see if the pump is working properly. Another advantage of this system (and a very important one) is the fact, that no matter how much oil the pump may force up through the leads to the bearings, when it reaches its regulated height in the splash or crank chamber (that is, the top of the overflow pipes), it then flows back into the bottom compartment. Thus your splash system is kept at a constant level, and there is the danger of excess of oil fouling your spark plugs, causing your motor to miss fire and probably making you alight before you care to, and perhaps in a place where the plane would be wrecked and the aviator injured. An instance of this was shown in Hamilton's return trip in his New York-Philadelphia flight. This system can, of course, only be applied to the 4-cycle type of motor.

IGNITION.

Most motor manufacturers construct their motors and supply magnetos with them, or so that they can be readily attached. There are some firms who are manufacturing magnetos who make in conjunction with them a small coil from which, owing to its peculiar construction, the user obtains two independent sets of ignition through one set of wires—the magneto and the battery ignition. The battery used in this system only requires 4 volts to operate it, and through the same wires to the spark plugs as the magneto ignition travels, the magneto distributer acting as the battery current distributer as well. The magneto used for this system costs little if any more than the ordinary one, and could not be distinguished from it except for an extra terminal or two. The coil and case used in conjunction with this particular magneto cost about the same as the ordinary vibrating coil, and the whole outfit is a great deal lighter than the old-fashioned way of separate magneto and battery ignition.

CARBURETION.

This subject is, and has been, a much discussed one. Probably no one part of the internal combustion motor has had as much experimenting, testing and trying-out as carburetion or the vaporizing of fuel. We all know what its principles are. It is the bringing together of air and fuel in certain quantities and proportions, which, when properly proportioned, forms a vapor, which is sucked into the cylinder, compressed and fired. True enough, we may all know what carburetion is, but do we know what perfect combustion is? You can use different quantities of fuel and air, even raw fuel, and your motor will run, but have you the perfect combustion which is needed in order to get the efficiency from your motor that it is supposed to deliver? When we first began to run automobiles, in tuning up our motors preparatory to going out upon the road, we usually adjusted the carburetor—that is, the flow of fuel and air—until we got the motor running fairly well, and if there was a good cold coating upon the intake pipe between the carburetor and the cylinders, similar to beads of sweat or a frosty appearance, we thought we had a good mixture, or, in other words, a perfect combustion. But in these later days, when we are becoming more educated as to carburetion and its peculiar pranks, we find that this theory of a frost laden or cold intake pipe is not entirely the proper one, and better results are to be obtained by applying heat up to a certain point on the intake pipe rather than to keep it so cold.

We have heard of many instances of motors stopping in high altitudes, causing a glide to earth. The reason usually given is that the carburetor froze. It is safe to assume that if the carburetor did freeze it was not until after the intake pipe had become so cold that there was not sufficient heat to successfully vaporize the fuel, and that this was the starting point of the trouble, instead of the carburetor freezing as the plane traveled through the air, as many are led to believe.

Choose the motor which has an iron manifold; better still if it is a part of the motor and cast integral with it, then get the carburetor as close to the manifold as possible. Great care should be exercised that a proper amount of heat be applied to the intake pipe between the point where the fuel and air come together, but no heat applied to the fuel line at any point before it mixes with the air, as this would only serve to consume an excess of fuel and result in a combustion that is far from perfect.

A motor having a lengthy intake pipe can be greatly improved by tapping the exhaust with a three-eighths diameter copper tubing leading the heat from the exhaust and winding around the intake pipe closely from the manifold down to the point on the intake pipe where the air and fuel come together.

The object or point to be attained by the application of heat to the manifold is to thoroughly vaporize all particles of fuel passing through the intake before it finally goes into the cylinder to perform its actual work.

If the motor is made by a manufacturer of some considerable experience, it is always best to use the carburetor he quotes as standard equipment, as in most cases a manufacturer is sure to have thoroughly tried and tested this particular point. Thus the user of the motor is saved considerable time and expense in experimenting and ascertaining which carburetor is best adapted to the motor he may be using.

In conclusion, with reference to the selection of a motor, get the benefit of all the advice and experience possible, have a talk with your propeller man. He is probably bubbling over with information. His vocation brings him in contact with all kinds of motors. If you are a member of an aeronautic organization, get the advice and experiences of your fellow members. None of us are too wise to learn. First be sure you are right, and then go ahead.

American Motors.

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1 Aeromotor—4-cyl., vert., 4-cycle.
2 Holbrook—4-cyl., vert., 4-cycle.
3 Boulevard—4-cyl., vert., 4-cycle.
4 Harriman—4-cyl., vert., 4-cycle.
5 Goblin—4-cyl., vert., 4-cycle.
6 Avis—4-cyl., vert., 4-cycle.
7 Kirkham—6-cyl., vert., 4-cycle.
8 Chicago Aero—4-cyl., vert., 4-cycle.
9 Wolverine—4-cyl., vert., 4-cycle.
10 Hall Scott—8-cyl., V, 4-cycle.
11 Hermann—8-cyl., V, 4-cycle.
12 Curtiss—8-cyl., V, 4-cycle.
13 Christie—8-cyl., V, 4-cycle.
14 Rirek—8-cyl., V, 4-cycle.
15 Rossenberg—8-cyl., V, 4-cycle.
16 Indian—8-cyl., V, 4-cycle.
17 H. De K.—8-cyl., V, 4-cycle.
18 Aircraft—8-cyl., V, 4-cycle.
19 Call—2-cyl., horiz., 4-cycle.
20 Elbridge—1-cyl., vert., 2-cycle.
21 Emerson—6-cyl., vert., 2-cycle.
22 Fox—4-cyl., vert., 2-cycle.

(Continued on page 201)

HOW FAST AND HOW HIGH MAY AN AEROPLANE GO?

By Harry E. Dey.

"With the aeroplane height record still steadily climbing into the chill, thin upper air, it is interesting to compare the present top-notch of mechanic flight—the 8,792 feet achieved by the Peruvian Chavez in his Bleriot monoplane near Paris day before yesterday—with the most inspiring things the gas-bag men have done. The accepted record altitude reached by any man in a balloon appears to be that of the Germans, Prof. Berson and Dr. Suering, upon an ascent from Berlin on the last day of July, 1901. These aeronauts, supplied with oxygen to assist respiration, reached a point 34,000 feet up. Thus the balloonists' highest is approximately six and two-fifths miles, while the aeroplanists' highest is a meagre mile and two-thirds. That is taking no account of Glaisher's famous ascent in the very infancy of aerostation, when he and his companion, Coxwell, narrowly escaped asphyxiation at a height which he estimated at over seven miles, but which modern scientists suspect to have been well under six. In 1875, in France, Croce-Spinelli and Sivel were actually asphyxiated in spite of auxiliary oxygen taken aloft with them, at a height of about 28,000 feet. It seems safe to assume, at any rate, that Chavez and Moyane and Brookins and the others who especially seek distinction as aeroplane high flyers are in no danger of sharing the fate of the two last mentioned balloonists, since before the air grows too thin to breathe it must become far too tenuous to support the weight of even a very light monoplane. There is still, however, the chance of freezing to death, suggested by the experience of J. Armstrong Drexel upon his skyrocket flight in Scotland."—N. Y. "Times."

AEROPLANES, at the present time, are mere copies of the first experimental ones, substantially the same in size and design. While the aviators have been getting more confident, and for this reason, along with improvements of the motors, have been making new records, there is very little of the higher records that are due to improvements in the aeroplanes. When the manufacturers get to the point where they can have more confidence in their product they will branch out and build much larger machines. There is no reason why they cannot be made indefinitely bigger; there is nothing in the nature of machinery that contradicts this statement. Engines, cars, boats, dirigibles, motors, etc., etc., all follow out the general rule that if you double the material the capacity will be doubled, with no limit to size short of man's capacity to construct; and the same principle follows out in nature—the ant and the elephant are built upon substantially the same lines. For speed, however, the smaller object, of a given design, is always handicapped; this is especially noticeable with boats.

Aeroplanes of the future will probably compare with the present ones as the big ocean liners do with their steam launches, and when we get them of such dimensions we may be conservative in demanding a speed of 200 miles per hour at an elevation close to sea level. As we ascend, the air grows rarified and consequently offers less resistance to the forward progress of the machine. At a height of 3½ miles the weight of the air is about one-half of that at sea level (Kent), the resistance then should be about one-half [with the same angle and speed—Ed.], with the consequent acceleration of the machine to double its sea level velocity with the same expenditure of power. True, as the Times stated in its above quoted editorial, the supporting power of the atmosphere has decreased; it has decreased one-half for the old 200-mile an hour speed, but this loss has been neutralized by the increased speed, the net result being the same buoyancy as formerly, which answers that criticism.

Kent states: "It is calculated that at a height of about 3½ miles above the sea level the weight of a cubic foot of air is only one-half what it is at the surface of the earth, at 7 miles only one-fourth, at 14 miles only one-sixteenth, at 21 miles only one sixty-fourth, and at a height of over 45 miles it becomes so attenuated as to have no appreciable weight."

According to the above statement, at something like 8 miles high the density is one-fifth of that at sea level, so a machine should be able to go five times as fast, or 1,000 miles per hour, at this height.

To assume an extreme case, beyond realization, it would appear that the assumption of the speed increasing in an inverse ratio to the density of the air is very conservative, for if we go beyond the limits of the atmosphere it requires absolutely no power to maintain any constant speed. This indicates that as we ascend from the earth the power required to overcome air friction and displacement decreases at a greater rate than we have calculated.

Another point in our favor is the fact that at that height the specific gravity will decrease somewhere around 2 per cent. and centrifugal force will have a slight tendency to carry us from the earth.

It may be said that these theories have not been borne out by the experiences of Hoxsey, Johnstone and other high flyers: that at their highest altitudes they have had to fight hard to attain their maximum altitudes, and that it was difficult to maintain them when acquired. This, however, the writer claims is due to the motor and propeller not being designed to meet these conditions. The ordinary motors at those high elevations take in only a small fraction of their normal charge of mixture, which in turn causes them to give out a much smaller fraction even than that of their initial power. With Hoxsey's record height of about 11,000 feet, the barometer reading is about 19½ inches, less than two-thirds the density at sea level. It is hard to state just what the loss in power would be at that height on account of so many different elements entering into the calculation. The scavenging would be improved in the light air, which, of course, would improve the power; then, again, the coldness of the charge would also improve the power until it got to the point of interfering with the proper gasifying of the charge, which it probably would reach long before attaining the maximum altitude. These troubles may be overcome in various ways; if the intake has a funnel-shaped opening which, when the higher altitudes are reached, can be pointed forward it will receive a considerable access in pressure due to the motion against the air, or a fan, pump or any other air compressing device may be used to keep the ingoing charge up to atmospheric pressure. Another method, which the writer considers preferable, is to design the engine with a very small compression space and a variable throw cam that can be adjusted at will; at the lower levels the cam would be so adjusted that the valve would close when only a fraction of the full charge had been admitted, while at the higher altitudes it would remain open during the whole of the suction stroke. This design of an engine has been more fully described by the writer in "Machinery" (April, 1910).

The speed of the engines of the present time are probably such as to furnish the greatest amount of horse power with sea level conditions, and consequently as they require more speed to meet the rarified conditions above, they lose additional power from that cause. This can be remedied by so designing the engine and propeller combination that the speed will be far below normal at the lower levels;

this will give it an opportunity to speed up to the most efficient running point as the plane ascends, and from that point on the pitch of the propeller blades may be increased until it become a very steep angle; the limit of the latter being the point where the efficiency of the propeller will become too low to be practical. To prevent reaching this point before acquiring the desired speed, a very large diameter propeller will have to be designed. In proportion to the size of the planes of such a machine, however, it would probably not appear out of proportion. There are many different ways of varying the pitch of boat propellers that would be applicable to aeroplane work.

When talking upon this subject, the writer is invariably asked: How can one live at that height; won't they be asphyxiated? Won't they freeze? In reply the writer would state that a closed car would naturally be used upon all the large machines; this car could have a funnel opening in front that would cause the air to compress in the car, in the same manner as that proposed for the engine, or any of the other means for compressing the air mentioned there may also be used. If the engine is located inside the car it will not require any separate compression means, as it can take its air right from inside the car; there will be the added advantage then of the air being of a normal temperature. The engine will also provide means for heating the car.

At first thought a thousand miles per hour, or more, appears impossible for any person to withstand, but when one analyzes the situation any argument against it falls flat; the occupant of the car will feel less discomfort than a passenger riding in an automobile along an asphalt street at 15 miles per hour. For example: when we ride in a railroad train at a mile a minute speed on a good roadbed we do not realize how fast we are moving; with a rough road we appear to be going twice as fast at half the speed. As a matter of fact, the only thing that will give us any idea of motion is passing objects, and as the effect from them is inversely as the distance away, and our closest object is 8 miles beneath us and we are upon a perfect roadbed—the air—and at that height there will be no cross currents or eddies, the resistance will be absolutely uniform so we will hear Mr. Wall Street inquiring, "What's the matter with that engine? We are going at a snail's pace," and the engineer will reply, "The engine is all right, the indicator reads 18 miles per minute."

P. S.—The above article was drafted out by the author during a voyage to Central America last October. It was not completed at the time due to lack of the necessary technical data, and as the trip consumed several months, the opportunity of completing it did not arise until January, 1911, when it was rewritten and revised. Sunday, February 5, 1911, the New York Herald published a page article, by an unnamed writer (he is probably more careful of his reputation than the author of this article), along the same lines. The theories in both are analogous.

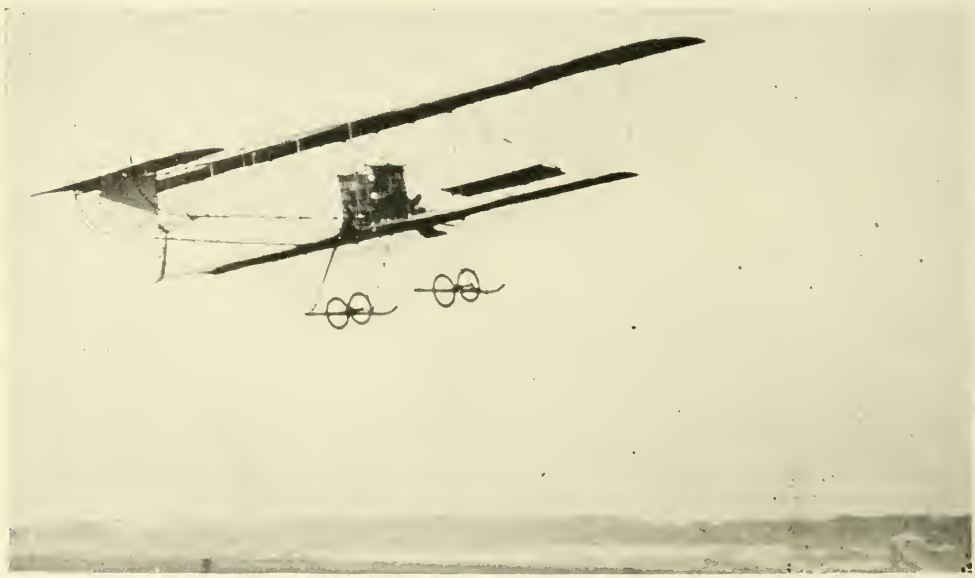
The nameless author states that small birds migrate at great heights, so high that they can only be seen by very powerful telescopes, and are known to make from 100 to 200 miles per hour, and that Gaetke, the German naturalist at Heligoland, has recorded the flight of plover and curlew at the rate of 22,000 feet (more than 4 miles) per minute. The plover has only a record of 76 miles per hour when flying near the earth. He thinks that the 4 miles per minute record may have been partly due to favorable winds.

Our technical data does not appear to agree. He calculates at 7 miles to double his speed, and at 20.4 miles to go eight times as fast as at sea level, or, with his assumed sea level speed of 131 miles per hour, 1,048 miles an hour, "which in the latitude of Paris would enable one to go around the world in 17 hours." Evidently his barometer tables do not agree with those possessed by the present writer. In all other respects their theories exactly agree.

The unique aeroplane of W. S. Romme, which Harold F. McCormick is financing, called in New York the "Merry Widow" and in San Antonio, where it now is, the "Umbrella," came to grief on April 14.

After running over the field between the artillery and cavalry posts, but never rising from the ground, the aeroplane struck a depression. At the same time a gust of wind smashed the machine. The result was a badly wrecked aeroplane.

W. S. Romme, the operator, escaped unhurt.



Sopwith Flying the Howard Wright.

SUCCESSFUL WIRELESS FROM AEROPLANE

VERY gratifying were the tests with wireless telegraphy conducted by J. A. D. McCurdy and the New York *World* during the Bridgeport, Conn., aviation meet, May 11, 12, 13 and 14. While no attempt was made to send long messages, decidedly successful results were obtained in sending signals by wireless to the dome of the Pulitzer Building, a distance of 55 miles. Several private wireless stations in New Haven also had no difficulty in picking up the dots and dashes shot into the air when McCurdy rapped the key which was placed on his steering wheel.

The new apparatus for sending aerograms from aeroplanes was built by Oscar Roesen, a young Brooklyn man who is an electrical engineer student at Stevens Institute, Hoboken, N. J. He constructed the little set for the New York *World* in the short space of three days. It is properly equipped for both sending and receiving messages when installed on an aeroplane and every consideration was given to the question of lightness and efficiency.

That a decided step forward in aeroplane wireless sets has been made as a result of the *World's* experiments was generally conceded by those who closely watched the workings of the new instrument both in the air and on the ground. Its total weight is between 40 and 50 pounds. The whole outfit is neatly packed in a light box about the size of a dress suit case. Lieut. Fickel, who was detailed by the War Department to attend the meet, was very much impressed with the set and sent a detailed report about the set to the Signal Corps.

Saturday, May 13, McCurdy took the wireless set up for the first time; he rose to about 2,000 ft. and sailed in a two-mile circle around the grand stand of the aviation field. A temporary wireless station built on the grand stand received every signal, sent by McCurdy during the trials, with pronounced distinctness. Unfortunately, on the first day of the experiments, May 13, the interference caused by numerous wireless stations operating at the same time that McCurdy was trying to reach the Pulitzer Building made it impossible for the operator who was listening in the dome of the Pulitzer Building to detect the signals from the aeroplane. On the following day, Sunday, when the atmosphere was undisturbed by the operation of other wireless stations, the spark sent out by McCurdy from the aeroplane was plainly heard on three different occasions. E. B. Hubinger, of New Haven, Conn., reported that the signals were also received at his station, located 17 miles from the aviation field, at Bridgeport.

The receiving qualities of the apparatus were not tried by McCurdy during the Bridgeport meet, but after a thorough test it was found that with the set, messages could be read from distances as far as 200 miles away. During experiments conducted from a dirigible balloon in England last February, aerograms were sent a distance of 30 miles, which was considered a good feat. The *World's* tests establish a new distance mark for wireless from an aeroplane, which is made all the more important by the fact that the instrument reached the heart of New York City, generally considered to have many adverse elements for wireless work.

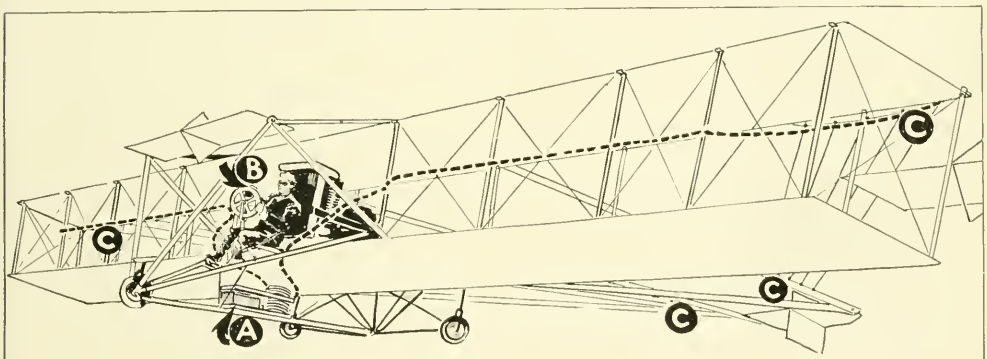
CONSTRUCTION OF THE APPARATUS.

The transmitter consisted of four-inch heavy output induction coil with ordinary spring vibrator; 15 dry batteries e.m.f., 1.5 and extra high amperage, connected in series; high tension condenser consisting of copper plates with special insulating compound as dielectric; helix consisting of wooden frame five inches in diameter, wound with 12 turns No. 6 B. & S. gauge, and ordinary telegraph key.

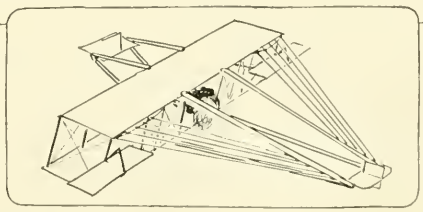
Receptor, two straight tuning coils wound with bare copper wire, Clapp-Eathahm detector and Brandes telephone receiver of 2,000 ohms.

The wires were strung from the tail piece of the machine to a point directly above the ailerons and constituted the aerial. For a ground, or more strictly speaking, for balancing aerial, the metal parts of the biplane were employed.

Previous experiments with wireless were described by Harry M. Horton in the January, 1911, issue.



Wireless System of "World."



Big Picture Shows How Wireless Set Was Placed on Aeroplane. A.—Wireless Apparatus B.—Telegraph Key Placed on Steering Wheel. C.—Wires Taking Place of a Ground (dotted line). Small Picture Showing How Aerial Was Rigged on Tail of Machine.

STATE AERO LEGISLATION

TWO bills are now before State legislatures, those of Connecticut and Pennsylvania. The Connecticut bill is about to be signed and will be the first State law controlling aerial locomotion to be passed in the United States. The official title of the bill is "An Act Concerning the Registration, Numbering and Use of Air Ships (sic) and the Licensing of Such Air Ships." A. Holland Forbes, who has worked in the drafting of the bill, at the suggestion of AERONAUTICS endeavored to obtain the use of one word in place of the two words "air ships" and a word which would be technically accurate. The governor of Connecticut, however, is averse to making the change. It was suggested that "aircraft" or "aerial vehicles" be used.

The use of the "airship" is much to be condemned. The international body has already settled upon the names of the different types of aerial vehicles. The Aeronautical Society of Great Britain and the Aeronautical Society in America have both published pamphlets dealing with aerial nomeclature. Publishers of dictionaries are using these pamphlets in preparing new editions. The "airship" is more and more being used in its correct sense—a common name for a dirigible balloon—by the public and by newspaper and magazine writers. It would be a most grievous mistake, AERONAUTICS believes, if the state of Connecticut should establish a precedent by adopting "air ship" or "airship" to cover any type of aerial craft. No less an error would it be to use "aeronaut" to cover the operator of any aerial apparatus. "Pilot" or "operator" would satisfactorily apply without objection.

Provisions of the Bill.

The term "air ship" (two words) in this act is defined as any kind of vehicle intended as a means for transportation of the air. The word "aeronaut" in this act includes the operator of such machine. The verb "fly" and the word "voyage," as used in this act, include every kind of locomotion by "airship."

REGISTRATION OF MACHINE.

Every owner shall file annually, in the office of the secretary of state, statement of his name, residence, post office address, description of machine owned or controlled by him, and the secretary of state shall register such vehicle, assign to it a number and issue to the owner a certificate of registration, which shall contain the name, place of residence, post office address of owner and the number or mark assigned to the vehicle, which certificate shall at all times be carried upon such vehicle and be subject to examination on demand by any proper officer.

Upon the transfer of ownership, registration shall expire and the person holding certificate must return it to the secretary with a written notice containing the date of transfer and the name, residence, etc., of the new owner. Registration expires at midnight on the 31st of December of each year.

Every such vehicle must display in a conspicuous place, designated, duplicate numbers and characters, not less than three feet in height, so as to be visible to those who may be beneath it.

LICENSES FOR OPERATORS.

"A person may fly over land or water owned or leased by him, or over land or water, the owner of which has given written permission to him to so fly, but no other person shall direct or operate an air ship, or act as aeronaut of any air ship, until he shall have obtained from the secretary a license for that purpose," and no license shall be issued until the applicant has been examined by one or more competent persons and the secretary is satisfied that the applicant is a proper person to receive it.

Nothing in the act shall prevent "the operating of an air ship by an unlicensed person over the age of twenty-one years or more, other than a person whose application has been refused, or where a license has been suspended or revoked, if accompanied by a licensed aeronaut, which said licensed aeronaut shall be personally liable for any violation of the provisions of this act." No license shall be issued to any person under the age of twenty-one.

Licenses are to be divided into three separate and distinct classes: License to operate spherical balloons dirigible balloons, and aeroplanes [or heavier than air machines]. "Applications for licenses shall be made upon blanks furnished by said secretary, and such application blanks shall be in such form and contain such provisions, not inconsistent with this act, as secretary may determine. A number shall be assigned to each license and a proper record of all applications for licenses and licenses issued shall be kept by secretary at his office and shall be open to public inspections. Each license shall state the name, place of residence and post office address of the licensee and the number assigned to him. Such licenses shall expire at midnight on the last day of February in each year. Such a license shall, at all times, be carried by the licensee when he is directing or operating an air ship in this state and shall be subject to examination, upon demand, by any proper officer.

"The secretary shall collect fees as follows: For the registration of every airship, five dollars; for examination and tests of applicant for license to direct and operate air ships, as provided in this act, such sum as he may demand, in any instance not exceeding twenty-five dollars; for license to operate and direct airships, two dollars; for every additional copy of certificate of registration or license, fifty cents.

"The secretary may suspend or revoke any certificate of registration or any license issued to any person under the provisions of this act, after due hearing, for any cause he may deem sufficient, and may suspend the license of the operator."

No airship shall be flown from any point in this state or to any point in this state, except the same is registered and except the air ship is under control and direction of a licensed operator.

"The air ship must carry throughout any trip a copy of the certificate of registry and of the certificate of competency of the aeronaut.

"Any non-resident of this state who has complied with the laws of the state within which he resides, relative to air ships and the direction and operation thereof, may fly said air ship in this state not exceeding ten days in any one year, without complying with the provisions of this act relative to the registration of the air ships and the licensing of directors and operators, subject, however, that the said non-resident must have been of a state requiring the registration of air ships and licenses to direct and operate the same and must have been so licensed to operate and said air ship must have been so registered in that state.

"The secretary of state may issue, without examination, a license to any aeronaut holding a license from any association of individuals or societies, formed for the purpose of promoting the science of aviation, the standing and character of which is such that the secretary is satisfied the said license has been issued on due examination and deliberation.

"Any person flying an air ship in this state who fails to comply with any of the foregoing provisions of this act, shall be fined not more than one hundred dollars or imprisoned not more than six months, or both.

"Every aeronaut shall be responsible for all damages suffered in this state by any person or persons from injuries caused by any

voyage of an air ship directed by such aeronaut; and if he be the agent or employee of another, in making such voyage, his principal or employer shall be likewise responsible for the same.

"This act shall take effect on January 1, 1912."

Pennsylvania's Bill.

The Aero Club of Pennsylvania has been able to have introduced another bill providing for the licensing of aviators flying in public in the state of Pennsylvania, with an additional license for aviators carrying passengers, and regulating the height which an aeroplane shall maintain when flying over spectators within an aerodrome and providing penalties for violations of provisions of the Act.

Upon passage of this bill, it will be unlawful for an aviator to fly either for sport, exhibition or prizes until a license is obtained from the Secretary of State, nor can a passenger be carried without an additional license permitting him so to do.

A fee of $5 is charged for an aviator's license, and $25 for a license permitting the carrying of passengers. No license will be issued until the Secretary of State receives evidence that the applicant is competent to fly.

This puts into control of the State the licensing of aviators. Each State, in making similar laws will, no doubt, demand evidence of competency, and is likely to make its own rules. This will mean a loss by the Aero Club of America of a great share of its powers. An aviator's license granted by the club will be of no use to an aviator, and the Aero Club of America will not be able, of course, to retaliate by refusing the aviators the privilege of flying in sanctioned meets.

The Pennsylvania bill requires that at exhibitions and meets the machine must fly at a height of not less than 200 feet if over the heads of spectators.

It also provides that it shall be unlawful at a public meet or exhibition for persons without proper credentials to trespass upon the grounds set apart for flying.

A fine of $50 or imprisonment of not more than a month, or both, for the first offense, and for the second offense $200, or imprisonment for not more than a year, or both; and forfeiture of license for the third offense, are the penalties for failing to comply with provisions of the act.

A non-resident aviator holding a license from some other State may fly in Pennsylvania not exceeding ten days in any one year without obtaining a license.

The State puts an official stamp upon the words "aviation," "aeroplane" and "aviator," as commonly used. An "aerodrome," heretofore the subject of great discussion, is defined as a "place set aside for aeronautical experiments or evolutions," which undoubtedly is the best application.

New York State Aviation Bill.

The Aeronautical Society of New York is having a bill introduced in the New York State Senate to cover the licensing of aviators and the control of flying within the State. The bill will have been in its final shape, no doubt, by the time this issue is on the press.

AERIAL MOTORS OF TO-DAY

(Continued from Page 196)

23 Leighton—4-cyl., vert., 2-cycle.
24 Roberts—8-cyl., vert., 2-cycle.

AIR COOLED.

25 Detroit Aero—2-cyl., horiz., 4-cycle.
26 Herrack—4-cyl., vert., 4-cycle.
27 Cowley—4-cyl., vert., 4-cycle.
28 Brott—4-cyl., vert., 4-cycle.
29 Metz—7-cyl., rev., 4-cycle.
30 Holmes—5-cyl., rev., 4-cycle.
31 Adams Farwell—5-cyl., rev., 4-cycle.
32 Rotation engine, 7-cyl., rev., 4-cycle.
33 Berger—7-cyl., rev., 4-cycle.
34 Hendee—7-cyl., rev., 4-cycle.
35 Berliner—7-cyl., rev., 4-cycle.
36 Macomber—5-cyl., rev., 4-cycle.

Foreign Motors.

WATER COOLED.

1 Panhard—4-cyl., vert., 4-cycle.
2 Aster—4-cyl., vert., 4-cycle.
3 Wright—4-cyl., vert., 4-cycle.
4 Green—4-cyl., vert., 4-cycle.
5 N. G. A.—4-cyl., vert., 4-cycle.
6 Wolseley—4-cyl., vert., 4-cycle.
7 Clement-Bayard—4-cyl., vert., 4-cycle.
8 DeDion-Bouton—4-cyl., vert., 4-cycle.
9 Gyp—4-cyl., vert., 4-cycle.
10 Clerget—4-cyl., vert., 4-cycle.
11 Gregorie—4-cyl., vert., 4-cycle.
12 Barriquand & Marre—4-cyl., vert., 4-cycle.
13 Daimler—4-cyl., vert., 4-cycle.
14 Jap—4-cyl., vert., 4-cycle.
15 Boyd—4-cyl., vert., 4-cycle.
16 Eole—8-cyl., horiz., 4-cycle.
17 Darracq—2-cyl., horiz., 4-cycle.
18 Dutheil Chambers—2-cyl., horiz., 4-cycle.
19 Crowley—2-cyl., horiz., 4-cycle.
20 Coudert—2-cyl., horiz., 4-cycle.
21 Clement—2-cyl., horiz., 4-cycle.
22 Gobron Brille—8-cyl., radial, 4-cycle.
23 Anzani—3-cyl., radial, 4-cycle.
24 Esnault Peltrie—7-cyl., radial, 4-cycle.
25 N. E. C. Mort—4-cyl., vert., 2-cycle.
26 Lucas—4-cyl., vert., 2-cycle.
27 Lamplough—4-cyl., V, 2-cycle.
28 Antoinette—8-cyl., V, 4-cycle.
29 E. N. V.—8-cyl., V, 4-cycle.
30 Simms—6-cyl., V, 4-cycle.

AIR COOLED.

31 Gnome—7-cyl., rev., 4-cycle.
32 Empress—7-cyl., rev., 4-cyl.
33 Salmson—7-cyl., rev., 4-cycle.
34 Farcot—2-cyl., rev., 2-cycle.
35 Pipe—8-cyl., V, 4-cycle.
36 Renault—8-cyl., V, 4-cycle.
37 Fiat—8-cyl., V, 4-cycle.
38 Paradox—4-cyl., vert., 4-cycle.
39 Boyd—4-cyl., vert., 4-cycle.

SUMMARY OF AMERICAN MOTORS.

17 vertical type (14 water cooled, 3 air cooled).
2 horizontals (1 water cooled, 1 air cooled).
9 V types (all water cooled).
8 revolving type (all air cooled).

Of above, of the 4-cycle type there are 31 and of the 2-cycle type there are 5.

The water-cooled total 24 and the air-cooled 12.

SUMMARY OF FOREIGN MOTORS.

19 vertical type (17 water cooled, 2 air cooled).
6 horizontals (all water cooled).
3 radials (2 water cooled, 1 air cooled).
7 V types (4 water cooled, 3 air cooled).
4 revolving (all air cooled).

Of above, of the 4-cycle type there are 35 and 4 of the 2-cycle type.

The water cooled total 29 and the air cooled 10.

SUMMARY OF FOREIGN AND AMERICAN MOTORS.

Total American motors	36
Total foreign motors	39
Total	75

36 Vertical type (31 water cooled, 5 air cooled).
8 Horizontals (7 water cooled, 1 air cooled).
3 Radials (2 water cooled, 1 air cooled).
16 V types (13 water cooled, 3 air cooled).
12 Revolving type, all air cooled.
—
75

Of these, 66 are 4-cycle type and 9 2-cycle; 53 are water cooled and 22 air cooled.

U. S. MILITARY AERONAUTICS

THE following relates to the progress and instruction of officers of the Maneuver Division, at San Antonio, Texas, in operating the Wright and Curtiss machines and the method of instruction that is being pursued.

A total of eighteen officers have been detailed as candidates for instruction upon their own application. These officers are permitted to have access to the hangars, study the machines, under the supervision of the instructor, and are then permitted to select which type of machine they prefer to operate. They are next taken for a flight in the machine, as a passenger, by the instructor.

None of these officers have been relieved from any of their regular duties with their regiments, but are required to show their interest and enthusiasm for this work by putting in their extra time in the manner described.

The only officers who have flown in the machines as pilots are Lieutenants Beck, Foulois, Kelly and Walker. They are not yet considered competent to act as instructors.

The United States Government will have, on July 1, three types of American-built aeroplanes, the third being one of the model "D" Burgess biplanes, built by the Burgess Co. & Curtis, Marblehead, Mass. The signal corps now has at San Antonio a Curtiss machine and two Wright machines.

This new Burgess machine is now at the Squantum field, near Boston, for trial.

Orders for aeroplanes and new pupils are coming in with satisfactory frequency. The model "D" machine which William Hilliard used at Mineola is to be equipped with a Gnome engine, which is already on its way. More than half a dozen pupils have paid $500 for a course of actual flying in Burgess machines.

Bids will be opened at the War Department May 20 for four sheds at College Park, 45 by 45 feet inside, 11 feet high at bottom of roof truss.

The Government has taken up thus far, through the War Department, only the subject of construction, maintenance and operation of aeroplanes, having regard mainly for their requirements in war. Carrying out this idea, as more fully explained by General Allen in the May number, aerodromes will be established at the various military tests throughout the country. The two Wright aeroplanes and the Curtiss have two officers for each machine, which have been with the Manoeuvre Division at San Antonio, Texas, for some time, have already done some practical and useful work in the way of carrying messages, have taken photographs and have made some experiments on the requirement of wireless telegraphy in the way of reporting information. Results are encouraging and the experiments will be continued.

"The aeroplane of the coming year," said General James Allen, at the banquet of the Aeronautical Society, "is supposed to carry at least 400 pounds of useful load in addition to the aviator and the necessary supply of petrol for a considerable radius of action, so that five of them would carry one ton. In estimating the strength of the Army, we generally deal in thousands of men. As a suggestion of what might be possible with five aeroplanes, it may be noted that a day's rations for one man, commonly called the haversack ration, weighs two pounds, or for each one thousand men, one ton. A thousand rounds of service rifle ammunition weigh one hundred pounds, so that one ton would provide twenty rounds of ammunition each for one thousand men. When it is known that these loads are carried at the rate of forty miles per hour, you can realize that a thousand men who are twenty miles away would in one trip of five aeroplanes be supplied with a day's rations in thirty minutes or twenty rounds of ammunition per man for the one thousand men in the same time. This brings up the question of what is possible with the aeroplane in the way of transportation for supplies of food and ammunition for the army. Taking the same unit, five aeroplanes for a ton, twenty such units would be capable of carrying twenty tons of explosive of incendiary material and dropping it over a fortification or besieged fortress within ten minutes. These thoughts are simply presented with a view of showing what it is possible to accomplish with a comparatively small number of these machines. Their promise to be the poor nations' defense is emphasized by the fact that some of the less wealthy nationalities are spending the most money for aeronautics.

"It is the policy of the War Department to place at the disposal of practical men the use of such aviation fields as may be established.

"The Department is also ready to co-operate with aeronautical societies in the other divisions of the work; that is to say, the scientific study of the problems of flight and research and experiments in the laboratory. Aviation has now reached a point where we can no longer depend upon empirical formulae for progress, and we look to aeronautical societies to formulate for us the true theory of dynamic flight."

ASCENSIONS

LOWELL, Mass., April 26.—Jay B. Benton, pilot, J. W. Flagg and Sumner Willis, aged 14, in the "Boston" to West Newbury, Mass., Time, 1 h. 45 m.; dist., 30 miles; alt., 4,600 ft.

KINGSTON, N. Y., May 15.—Chas. F. Walsh, pilot, A. Leo Stevens and Wm. F. Hoehn, secretary of the Kingston Chamber of Commerce, made an ascension in the "Stevens 27," landing at Erving, Mass. The balloon passed over the Berkshire hills, and Pittsfield was sighted. Kingston supplied pure coal gas, with a lift of 48 pounds to the thousand cubic feet direct from the benches, after going the washer and dryer. Many fires were noted. It is expected that an aero club will shortly be formed in Kingston. Distance 100 miles.

ST. LOUIS, Mo., May 7.—Wm. F. Assmann, Lieut. John P. Hart, Sergt. Joseph O'Reilly and Sergt. Emil Wunder, of the Signal Corps of the Missouri National Guard, in the "Miss Sofia" to Springfield, O., 357 miles. A wireless telegraph outfit was carried and the other record was established when communication was had with Fort Leavenworth, Kan., Chicago, Kansas City, Milwaukee and other large cities. This is the first time that wireless messages have been received by passengers in a spherical balloon.

PHILADELPHIA, May 9.—Dr. Thomas E. Eldridge, John H. Noggle and Mrs. Ada T. Kurtz in the "Phila. II." After being in the air from 9:30 a. m. to 3:20 p. m., the balloon was taken in tow by a tugboat and the aeronauts hauled along by the drag rope to a final landing at Delaware City. The balloon was drifting down Delaware Bay, ballast was low, and it was in danger of going out to sea, when Dr. Eldridge's signals were caught by the tug. When the tugboat reached its dock the balloon was hauled down and the passengers got out of the basket. Several times during the towed part of the trip the balloon dipped down into the water and finally Mr. Noggle got on board the boat.

HAMILTON, O., April 25.—Albert Holz and Charles Troutman in the "Drifter" to Princeton, Ill., landing there the following evening. Hamilton was left at 7 p. m. Distance 280 miles.

AUTO CLUB $1,000 MOTOR PRIZE

THE Automobile Club of America has finally announced rules for its Thousand Dollar Prize to be awarded the competitor whose motor secures the highest number of points according to the scale drafted by the club. The prize will not be awarded in any case unless a motor runs continuously for at least three hours at what the committee considers a satisfactory load and speed.

AERONAUTICS for a long time was insistent upon the necessity for prizes and the Aero Club of America was urged to offer prizes without result. It was with much satisfaction that AERONAUTICS viewed the first announcement of the Automobile Club's competition.

This prize is the only one open in America, at least, which has for its object real advancement in the science of aeronautics. Other prizes could be offered for greatest weight lifted; for set or greatest weight lifted a certain height in the fastest time, or combinations of weight, time, and height; for speed in climbing, distance, stability, flight with least horsepower per pound weight, duration, slowness of flight, etc.

Prizes for Liberty flights and other dangerous "stunts" are not asked by those who have the real interests of the art and science at heart.

Entries for the competition will be closed at midnight, July 1, 1911.

The test will be conducted in the laboratory of The Automobile Club of America, 54th and 55th Sts., New York City.

The entrant shall provide, besides the motor, complete equipment for operating the same, including:

(a) Complete ignition equipment. (b) Lubricant and complete lubricating equipment (with tank, if necessary). (c) Complete cooling equipment (including radiator, pump and piping, if necessary). (d) A suitable flange or fitting for connecting motor to dynamometer, and sub-frame, if same is necessary for adapting motor to the club's adjustable motor support. (e) Suitable piping, etc., for connecting engine to cooling system, lubricating tank and fuel tank.

The club will provide: (a) All necessary apparatus for making required measurement. (b) Fuel, the same to be gasolene of about 0.72 specific gravity (64 degrees Beaume). (c) A blower capable of delivering from a 4 ft. x 4 ft. opening a blast of air (at room temperature) having a maximum velocity of approximately fifty miles per hour. This may be placed anywhere to suit the entrant.

THIS TRIAL SHALL INCLUDE:

First.—A test of three hours' duration at constant speed as nearly as can be maintained. The speed may be selected by the entrant. At the start, the load will be set to hold the motor at this speed for the particular spark and throttle position selected by entrant, and this load shall not be varied during the three-hour test except as it may change automatically, as a result of the variation in the speed of motor.

Second.—A test to determine ease and certainty of starting: (a) From a standstill, and (b) Starting up again while engine is still turning over slowly.

Third.—Any other short test which the committee may require, in order to properly award the points under the headings given below.

WEIGHT.

(a) Weight. In these rules the "weight of the motor and all accessories" shall mean the weight of the motor and all its parts ready to run, together with the following: Complete ignition equipment, including all necessary wiring; complete carburetor equipment and all gasolene used during the three-hour test (but not tank for latter, or piping from tank to carburetor); complete lubricating equipment, including tank, all piping and all oil used during three-hour test; water-pump, radiator, all piping and all water in system at time of starting three-hour test; and all other devices which form essential parts of the motor equipment. It does not include flywheel as none is necessary.

(b) No motor shall be eligible for this competition which weighs, with all its accessories, more than ten pounds per brake horsepower (which horsepower it can develop continuously for three hours.)

MEASURING POWER.

(c) The power shall be measured at the drive shaft, which shall be direct connected to the club's electrical cradle-type dynamometer. (d) During the three-hour test no adjustment of the motor, carburetor, or of the fuel apparatus or ignition system will be allowed, except adjustment of the throttle and the timing lever, and no replenishing of the supply of lubricant or of water in the cooling system will be permitted. (e) Four attempts to start motor in beginning the three-hour test will be permitted. If, in making these starts, the motor runs more than five minutes, the test will be considered as begun, and all readings of fuel consumption, speed and torque will start at the end of this five-minute period, and this shall be considered the official beginning of the three-hour test. In starting, if the motor runs more than one and less than five minutes, this shall constitute a false start. Only three such false starts will be allowed.

COOLING.

(f) For the purpose of cooling the motor or radiator, or both, any entrant may make use of the blower mentioned above.

No motor shall receive any points. (1) If it fails to complete the three-hour test. (2) If, during the three-hour test, it fall below a speed which is 85 per cent. of the declared speed. (3) If, having made three false starts, it fails to start on the fourth attempt.

SCORING.

In scoring, the points awarded will be based principally on the three-hour test, but will depend to some extent on the other tests, and will be apportioned under the following heads:

Item A shall include: Ability to run steadily at the speed declared throughout the three-hour test. During this test the motor will be allowed to drop to that speed which is 95 per cent. of the declared speed, without penalty, and will receive 25 points. For each drop in speed of 1 per cent. of the declared speed below 95 per cent. of said speed, 2½ points will be deducted under Item A. If, during the three-hour test, the motor falls below that speed which is 85 per cent. of the declared speed, no points will be awarded under any item.

Item B.—Each motor which can demonstrate the ability to start easily, to run slowly, and to accelerate quickly under load up to the declared speed, shall receive 5 points. Motors failing to demonstrate this ability will receive no points.

Item C.—That motor which consumes the least quantity of fuel per brake horsepower per hour during the three-hour test will receive 15 points, and other motors will receive a number of points inversely proportional to the amount of fuel they consume as compared to the amount of fuel consumed by that motor showing the greatest economy per brake horsepower per hour. The power considered will be the average power delivered throughout the three-hour test.

(*Continued on page 214*)

BALDWIN ALL-STEEL BIPLANE

Captain Baldwin in the Steel Machine. *Photo by Edwin Levick*

THE new biplane of Capt. Thomas S. Baldwin, "Red Devil the Third," is a simplified and standardized replica, in the main, of his two previous machines, of which details have appeared in AERONAUTICS.

This latest machine is built entirely of steel, save for the cloth on the planes, the main lateral beams and ribs. It is very speedy, having been timed around 60 miles an hour. As soon as the machine was ready for trial, Captain Baldwin sent it over the Mineola field a couple of times at first attempt. No changes have been made in balance, and the genial captain has been making the last three weeks in May some good flights over to Hicksville and back and around the Hempstead Plains.

The parts were built for Captain Baldwin to his designs by C. and A. Wittemann of Staten Island.

Main Planes.—A novelty has been introduced in plane construction. The ribs butt against both the front and rear lateral beam, and are attached by square tube ferrules, as shown in the sketch. There is no trailing edge, considered as a structural part of the sections of the plane. The trailing edge, or surface to the rear of the rear beam, is built separately, with its own little beams and ribs and may be either attached rigidly or hinged for use as ailerons. The main planes are divided up into five-foot sections (except the center one), which are quickly interchangeable. There are also short panels which can be fitted at either extremity of one or both the main planes, thus increasing the area of the planes by 10½ or 21 square feet, as desired. These are shown attached in the drawings. The diagonal wire bracing of each section of panel runs over the top of the ribs under the Baldwin vulcanized fabric, which is tacked to both sides of the ribs and beams. The cloth is not laced to the panels, as formerly.

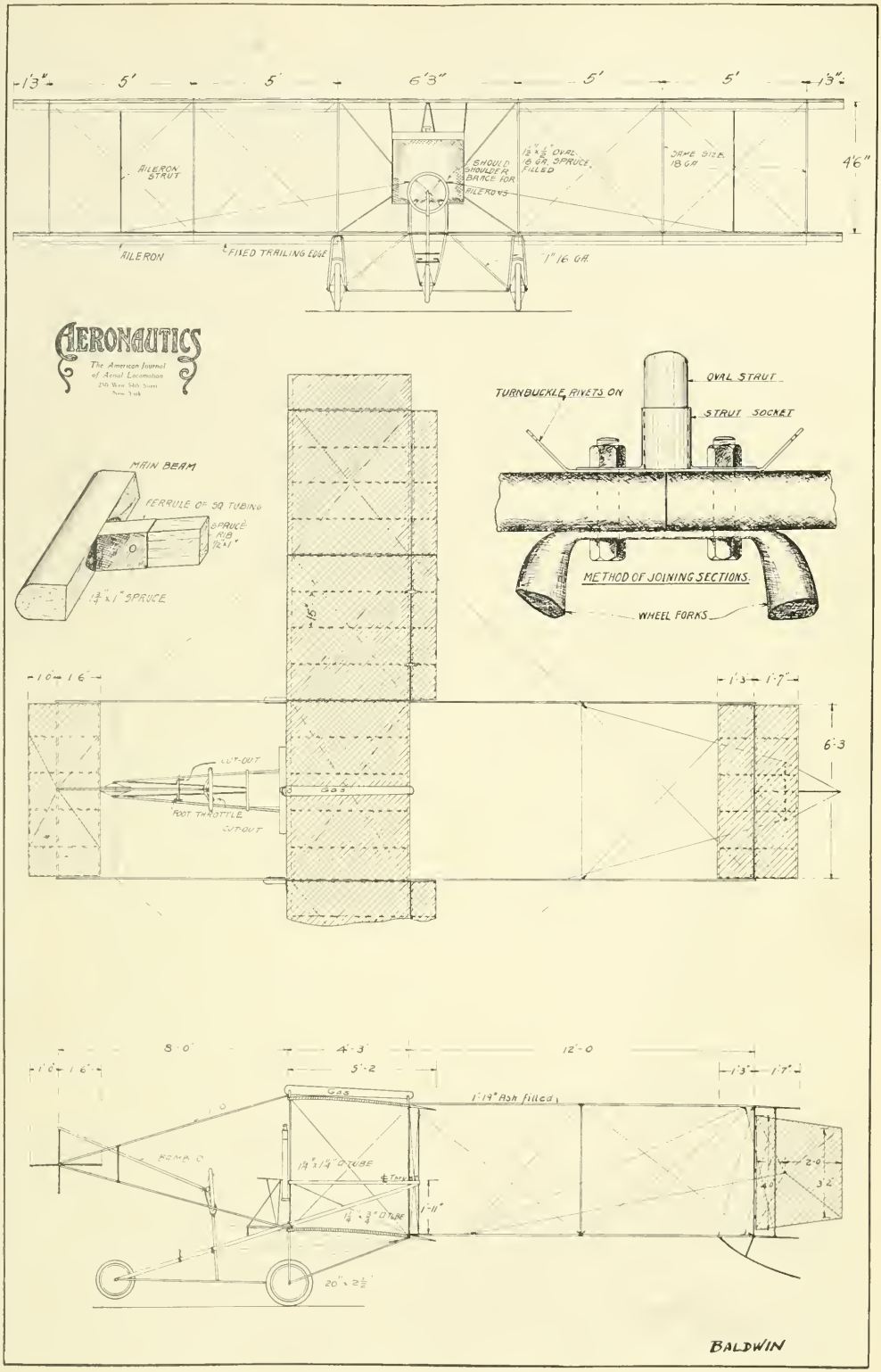
Outriggers.—These are all of round steel tubing filled with hickory. There are no joints in these; they run out to tail and elevator in one full length.

Running Gear.—The two Hartford tired wheels, which, with the tail skid bear the weight of the machine, are centered directly under the front beam of the lower plane. The front wheel is used only in landing. Two pieces of round tubing run from the hub of this front wheel back to the distance rod between the other two wheels. Rectangular hickory filled tubing runs from the front wheel up to the rear of the engine bed. Great care has been taken to avoid drilling holes and weakening this member. The cross pieces for foot rest, steering pillar and seat frame are all attached by clamps.

Power Plant.—Hall-Scott 8 cylinder (4 x 4) V-type 60 h.p. motor, driving direct a 7-ft. diam. 6-ft. pitch Gibson propeller. Hall-Scott radiator, Mea magneto, Stromberg carburetor. Water circulation is by a large capacity centrifugal pump. The oiling system is by gear driven pump which drives the oil through the hollow cam shaft into the oil compartments under each pair of cylinders.

Stability.—Ailerons hinged to rear beams of both upper and lower planes. A light steel tube strut connects each pair. The ailerons are positively operated in both directions by Roebling cables running through copper tubes with Bowden wire inside where bends occur, to the shoulder brace. The aviator's leaning to the high side causes the pair of ailerons on the low side to increase the lift on that side and decrease the lift on the high side.

Controls.—The front elevator works in conjunction with the movable surface of the tail. Pushing forward on the steering wheel and pillar steers down, and vice versa. Turning the wheel right or left steers respectively. The rudder cables run once around the steering wheel (fastened at the top), down through the hollow pillar or column through Bowden wire, cross and run under the lower plane out along the outriggers to the ends of the horizontal mast on each side of the rudder. The right foot cuts out the magneto. There is also a snap switch on the steering wheel, as well as a knife switch under the left corner of the seat. The left foot works the throttle.



New Baldwin "Red Devil."

THE NEW FAIRCHILD MONOPLANE

THE 1911 monoplane, the second one built of own design, of Walter L. Fairchild, Mineola, L. I., had its first trials on May 11, with Auguste Denis as pilot. Denis, who has a pilot license of the A. C. F., has been engaged by Mr. Fairchild to fly the machine. During succeeding days several short flights were made about the field. The aviator was cautious and took no chances with this new machine.

Like its predecessor, it is built entirely of steel tubing, with the exception of skids, ribs and cloth covering.

No change was made in balance or controls, and it flew the first time out. The big Emerson engine turned up 520 pounds standing thrust at 950 r. p. m., with a special new type Gibson propeller. In flying, the engine speeds up to 1,150 r. p. m. The scales could show no greater pull, as the pointer went to the limit. No difference was found in leaving the grounds, whether 35 pounds or 215 pounds of gasoline were carried.

On May 4 a wheel was injured by landing in a hole, and through a misunderstanding the aviator started another flight. To avoid some bystanders while at a low elevation, he steered for the ground and the wheel gave way, breaking the skid and standing the machine on its nose. Outside of the running gear, but one rib was broken, the crankshaft bent and the propeller demolished. The strength of the steel construction has been made very evident.

Main Planes.—The wings have steel tube lateral beams and bridge-construction main ribs, which are 2 ft. apart, with additional light ¼-in. by ¼-in. spruce ribs in between spaced 8 in. apart. Light spruce strips ¾ in. by ¼ in. run laterally with the wing about every 8 in., screwed to the main ribs. Wilson & Silsby untreated cloth is used to cover both sides, and is tacked on main ribs and edges and then bound with rattan around the edge of the wings and on the first three main ribs out from the "fuselage" on each side. There is 7 in. of warp up and down on each wing.

Fuselage.—All of steel. No aluminum or other metal used. The fuselage is in three sections. The forward section is 10 ft. long and the two rear sections 9 ft. each. The ends of the longitudinal members butt together at the joints and a 6-in. sleeve is fitted over tight and pinned. Special sockets are used which fit over the 1-in. 22-gauge tubing of longitudinal members and into the horizontal and vertical struts. These special split tees can be easily removed for replacements. The stay wires are piano No. 12 English gauge. The manner of fastening and tightening is illustrated. Pieces of 1½-in. tubing ½ in. in length are used, with four holes drilled for the common spoke nipples. From the wire tightener in the center of each panel the wires go through copper tubes inserted in holes drilled through the sockets and tubing at joints. The three sets of wires which go through at each joint are wrapped with copper wire on either side of the copper tube and soldered to prevent slipping either way. This peculiar form of turnbuckle adjustment accomplishes the object of its design, which was to allow a certain amount of flexibility to the fuselage. The first 3 ft. of the fuselage is yet to be covered with aluminum sheet and the balance with cloth to reduce head resistance. The construction allows walking all over it, suspended at either end, without visible deflection.

Stability.—Warping of wings by turning hand wheel to the high side. A sprocket on the hand wheel engages chain to which is connected wires which go down to another chain and sprocket fastened to grooved pulleys, over which run the warping wires. The elevators work by pushing or pulling the steering column. The rudder works by a foot yoke, the wires not being crossed.

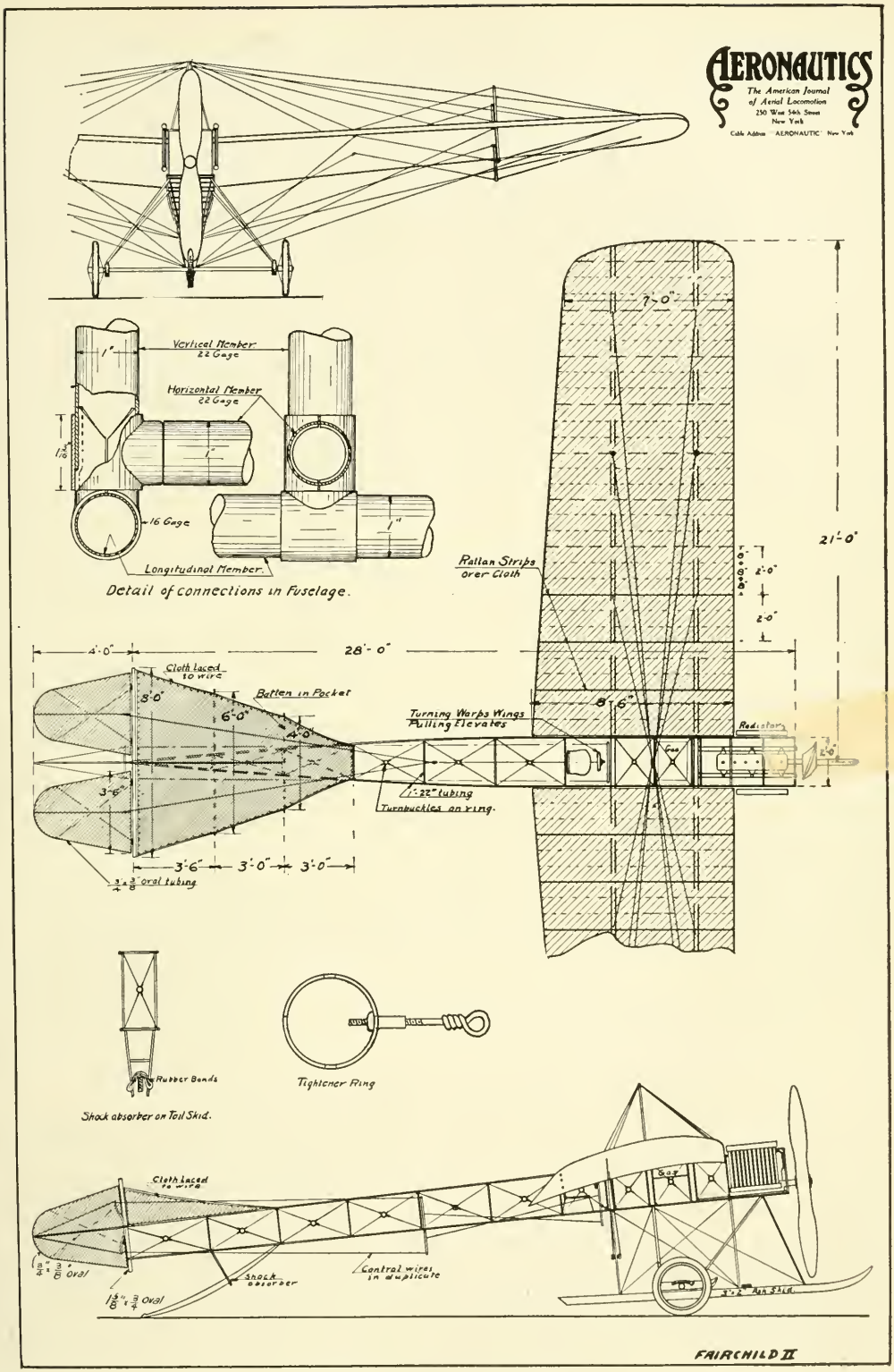
Running Gear.—This to be changed to include a center skid with trucks similar to the Farman, using Goodyear Dunlops 24-in. by 3-in. tires. The tail is supported by a skid, with shock absorber.

Power Plant.—Emerson 100-horsepower, six-cylinder, two-cycle engine mounted inside the frame, with a special flat radiator on each side, weighing 20 pounds each. Eight hundred feet of tubing is used in the radiator. Each tube is flattened down to a cross section of .75 in. by .03 in. The circulation is by gear pump. Mea magneto, special Schebler carburetor. The gasoline is fed by gravity from a 30-gallon rectangular tank. The consumption of gas is about six and a half to seven gallons an hour. Oil at the rate of a quart to five gallons of gas is sufficient for lubrication. The propeller is a Gibson special, 8 ft. diameter by 6 ft. pitch, shaped like the well-known "Normale," with the cross sections of the Chauviere. A Warner tachometer registers the revolutions per minute. The spark advance is controlled by a small wheel at the left hand. The gas and air control is at the right hand. All control wires are double 1/16-in. Roebling cable and No. 14 "aviator" wire. There are no pulleys for controls.

Weight.—Four hundred and seventy-five pounds without the power plant, which adds 400 pounds, including radiator and water, ready for gas and operator.

Rah for Willard. He is at last coming back to the East, the land of his nativity, to set up a new machine. No details have been given out, but it may be that it will be rudderless. "Charlie" has been married and there's no telling. Congratulations on both events!

Ready to Start in the Fairchild II. *Photo by Edwin Levick*



The Fairchild Monoplane, Type II.

The Hempstead Plains Aviation Co.

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Flying is a Fine Sport, a Splendid Science and a Rich Livelihood.

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AERONAUTICAL SOCIETY'S BANQUET

THE most important as well as the largest dinner ever held by an aeronautical organization in this country, was that of The Aeronautical Society, the first of a yearly series, in the Hotel Astor, New York, April 27. Eight hundred people were either diners or interested auditors.

The President of the United States, William H. Taft, the guest of honor, was the humorist of the evening. His presence was the climax-capping feature of an evening of events. He was presented with a gold membership card of the Aeronautical Society of Fort Worth and the Aeronautical Society of New York. Hunter L. Wilson, of the Fort Worth organization, traveled to New York for the sole purpose of presenting the President with this card. The President stated that he would consider the card good for one flight in the first aeroplane capable of carrying him, as he put it.

With Hudson Maxim, president of the Aeronautical Society, as toastmaster, the speakers of the evening included: Honorable William Randolph Hearst, who received a gold medal from the Aeronautical Society in acknowledgment of his coast-to-coast $50,000 prize; Brigadier General James Allen, Chief Signal Officer of the United States Army; Gutzon L. M. Borglum, the famous sculptor; Dr. Charles Doolittle Wolcott, Secretary of Smithsonian Institution; Rear Admiral Robert E. Peary; Professor Willis L. Moore, Chief United States Weather Bureau; Thomas A. Hill, Director of the Aeronautical Society; W. R. Turnbull, of Canada, representing the Aeronautical Society of Great Britain; and Captain Washington Irving Chambers, of the United States Navy.

The speech of Mr. Hearst was as peaceful in tone as was President Maxim's warlike. "Every dog has its day, but the dogs of war have had their day. The conduct of war belongs to the black barbarity of the past," he said; "the navigation of the air belongs to the bright civilization of the future, a civilization upon the bare threshold of which we reverently stand."

In urging the necessity for the United States Government to take up the study of aeronautics and telling of what has been done by the Signal Corps thus far in buying machines, General Allen pointed out the progress of military aeronautics in other nations as applied to research work.

"Realizing the importance of aeronautics, Great Britain has recently appointed an Advisory Committee for aeronautics, with the Right Honorable Lord Rayleigh as president, and nine other gentlemen prominent in military, naval and physical sciences, as associates. This committee has submitted an interim report, which has been printed for Parliament, and outlines a thorough and systematic programme for the theoretical and experimental investigations in aerostatics and aerodynamics as bearing on the important problems constantly arising in aerial navigation. The National Physical Laboratory, which corresponds to the United States Bureau of Standards, has been provided with special buildings and apparatus suitable for undertaking various kinds of aeronautical experiments and tests under the direction of the Government to encourage in every possible way the advance of this new science in Great Britain.

"In Germany, the University of Gottingen has for a number of years given special attention to aerodynamical experiments in a specially constructed and well-endowed laboratory, and it is understood that in the latest designs of dirigible balloons for the German Government, valuable assistance has been received from the study of models in this laboratory.

"In France, the University of Paris has recently been richly endowed and provisions made for carrying forward similar experimental work for the citizens of the French Republic.

"In Russia, one of the best equipped aerodynamical laboratories in the world has been founded near Moscow. In addition to this, aerial navigation has become the subject of special instructions at various universities in Europe."

Secretary Wolcott sketched out the work of the Smithsonian Institution, the only one in this country for many years to encourage aeronautical research, beginning with the experiments of Langley, telling how they came to be financed, and promised the co-operation of Smithsonian Institution with any aerodynamic laboratory which might be established.

Rear Admiral Peary discussed the possibility of reaching the pole by aeroplane and prophesied its feasibility.

"Dinner in New York to-day and the day after to-morrow in London is not impossible," said Professor Moore, who applied meteorology to flying as a means of great speed.

Mr Hill outlined the history of the Society to date, commented, with industrial data, upon the status of commercial aeronautics in Europe, and broached the Society's expectations of endowing an Aeronautical Chair.

With special credit for Eugene Ely's flight to a battleship, Captain Chambers spoke of the expectations of the Navy and the development of a special navy aeroplane of which the Curtiss "Triad" is the first of its type.

The big ball room of the Astor was appropriately decorated with a great number of beautifully built models, some even almost half size, like the Wittemann glider. At each plate was a toy balloon attached to a string. The menus were unique and and most attractive. In harmony with the color of the paper stock the covers were made of the latest Goodyear rubberized cloth. Everyone who attended had something complimentary to say about them.

NATIONAL LICENSING

WITH a national law covering the registration of aeroplanes and the licensing of operators, along the lines of the marine law, as urged by the Aeronautical Manufacturers' Association, or with state laws already before several legislatures and shortly to be introduced in others the Aero Club of America will find its licenses of no value.

Its foreign affiliation will be valuable only for international recognition of records and for the exchange of club privileges.

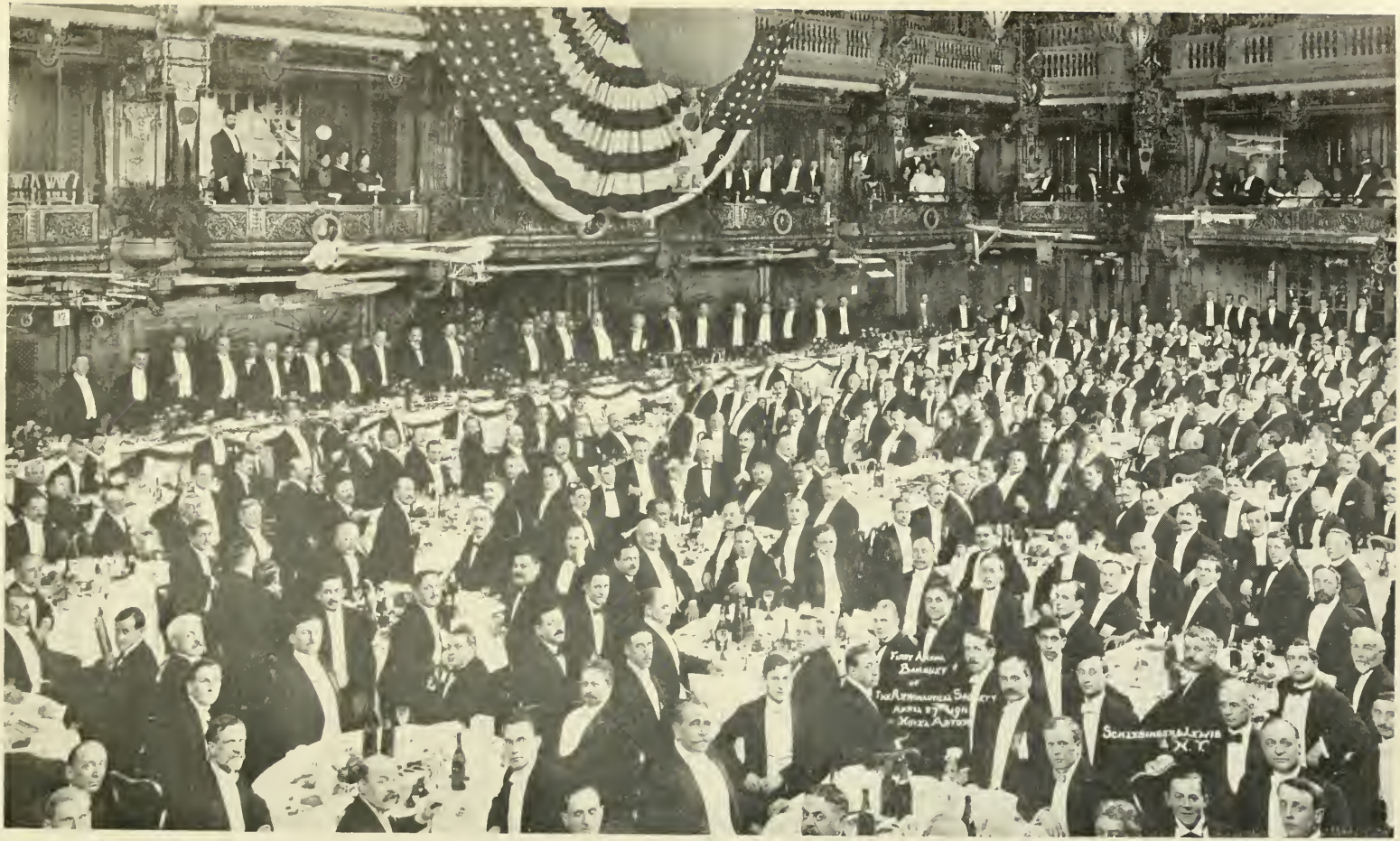
The club cannot adopt conditions differing from those laid down by the international body.

It is apparent that it cannot adopt the same conditions for the issuing of licenses as may be adopted by a state or the nation. If state laws are the outcome of present activity, it is probable each state will have laws more or less at variance with those of another, as in the case of automobile laws.

No state can delegate powers to a club or accept Aero Club licenses as sufficient evidence for the issuance of state licenses.

The club will not be able to conduct meets or license meets, for by the terms of its foreign agreement such meets can admit only aviators holding club licenses; and besides, the state would not allow a meet unless contestants were duly qualified under state laws.

The club licenses would be merely an honor. An aviator could not fly with that alone; he could fly with state licenses only; the former would be but a decoration—the two would amount to an absurdity.



First Annual Banquet, Aeronautical Society. *Photo by L. Lewis*

Reading from left to right; Captain Washington Irving Chambers, Hiram Percy Maxim, Colonel J. J. Astor, Pierre Dupont, Nathan Strauss, Arthur Brisbane, Honorable Timothy L. Woodruff, Thomas A. Hill, Professor W. R. Turnbull, Lee S. Burridge, Professor Willis L. Moore, Dr. Charles Doolittle Wolcott, President William Howard Taft, Hudson Maxim, Honorable William Randolph Hearst, Rear-Admiral Robert E. Peary, Honorable John W. Goff, General James Allen, United States Senator J. S. Martine, Congressman John J. Fitzgerald and Chancellor John Henry McCracken.

For Safety's Sake—
Goodyear Tires—Goodyear Fabrics

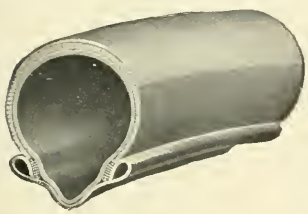
As the aeroplane lands, the tearing loose of a tire means serious injury to the machine. Equipped with **Goodyear Detachable Aeroplane Tires** injury is impossible, for the tire is held to the rim in a vise-like grip by wires in the base of the tire.

Aeroplane Wings: Cold and dampness cause plain, varnished or treated aeroplane fabrics to contract, **tighten up.** This puts on the planes a severe twisting strain that turns into damaging **vibration** the instant the fabric begins to dry out, when they loosen, flap and beat against the ribs. **Goodyear Fabric,** the new rubberized Aeroplane Cloth, makes this stretching and relaxation **absolutely impossible.** It is moisture-proof, **weather-**proof. It cannot shrink nor stretch when subject to atmospheric changes. Furthermore, it will not mildew and rot. It lasts for years.

GOODYEAR

Detachable Aeroplane Tires

The Goodyear Detachable Tires embody the principles of the famous Goodyear Auto Tires. They are the lightest aeroplane tires manufactured. They combine the greatest possible resiliency with **extra tough tread**—hence almost unpuncturable.

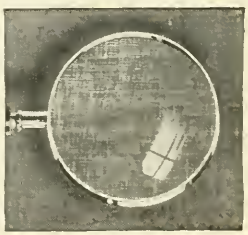


Judge the Goodyear by the fact that these aviators have equipped their own machines with it:

Glenn Curtiss, Brookins, Parmelee, Ely, Garros, Hilliard, Grahame-White, Charles K. Hamilton, Capt. Thos. S. Baldwin, J. A. D. McCurdy, Harkness and scores of other famous American and foreign aviators.

Rubber-Coated Aeroplane Fabric

The wonderful fabric's coating is permanent, and constructed to last for many years. It is unaffected by heat or cold. Its invention is the result of an exhaustive investigation by experts in France, England, Germany, Switzerland and America. We have constructed special machinery and a large new building for the sole purpose of making **the** perfect aeroplane fabric. Our exclusive process is thorough in every particular.



Goodyear Rubberized Aeroplane Fabric is the ***safest long-wearing*** aeroplane cloth known to science.

The Wright Company tried for months to get a fabric that would not shrink and stretch. They bought yards and yards of material in America and Europe, but none of it was satisfactory. Now they use Goodyear Rubberized Aeroplane Fabric exclusively. That just about tells the story, doesn't it?

Goodyear fabrics are now being adopted also by the Burgess Company & Curtis, Curtiss Aeroplane Co., The Metz Co., The Detroit Aeroplane Co., and practically all the American manufacturers as well as the foremost aviators in the world.

These pioneers know what covering is best.

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AERO CLUB AND NATIONAL COUNCIL

THE National Council of the Aero Clubs of America, fondly planned to be the citadel of aeronautics in this country, is now but an outermost entrenchment which may or may not—according to the percentage of backbone owned by those sincerely interested in advancement—prove to be the scant burial place of national affairs. Let it be hoped otherwise!

In the beginning, some of the Aero Club of America's affiliated clubs seceded, and, with others, formed a so-called national body, primarily intended to control all national affairs in this country on a democratic basis. The delegates to the first meeting came armed with a firm determination to deprive the Aero Club of America of its alleged arbitrarily assumed powers, which the delegates thought it should not wield. With the club's foreign affiliation as an unduly inflated billy, a majority of the delegates were made to imagine the leadership of the club imperative, and an agreement of organization was framed and adopted.

This proved a leaky vessel and a new one was thought desirable. Committees from the National Council and the Aero Club met and considered and framed a new agreement—or, rather, a new agreement was written out by W. W. Miller, one of the members who represented the Aero Club on this conference committee. It was not changed one iota from that time until it was presented to the National Council at the April 4 meeting and ratified by the Council.

The president of the club and two other representatives of the club were present at this ratification meeting, and at the moment each clause was read over and voted upon; and not a word of objection was made.

AERO CLUB REPUDIATES ITS CHILD.

At a meeting of the Aero Club of America, held May 4, this agreement of organization and by-laws of the Council were brought up for adoption and signature. An adverse vote was obtained and the document was not ratified on the grounds that a clause to the effect that *no club shall be a member of the National Council unless it be affiliated with the Aero Club of America* was not incorporated therein; the A. C. A. claiming that it was agreed upon by the conference committees. Members of the conference committees state they never heard of any such clause. W. W. Miller and Major Samuel Reber, representing the Aero Club on this committee, were not present on May 4.

In answering a question of a delegate at the April 4 meeting of the Council, Mr. Miller stated that with the ratification of the agreement he saw no further reason for the Aero Club's having affiliated clubs, and that he understood membership in the Council was tantamount to affiliation with the A. C. A.

The president of the A. C. A. has even himself said that the Council must be paramount in national affairs. This is evidenced by his signature to the report of the conference committee, of which he was chairman. He has apparently changed his mind recently—perhaps just about the time the club discovered it had overlooked a card.

AERO CLUB—AUTO CLUB AGREEMENT.

A few days after the Aero Club's dishonoring its offspring, the Automobile Club of America advised the Aero Club of America that the latter was not in a position to make contracts or agreements with other bodies as the Aero Club already had an agreement with the Automobile Club by which the latter recognized the former as its "Aviation Section."

Instead of the Aero Club's being in a position to dictate to the Council, it is not even free to make an agreement with the Council. It may even be found that clubs at present holding affiliation agreements with the Aero Club may find themselves not affiliated at all.

While the National Council has worked all along in good faith, it is apparent that the Aero Club allowed the Council to ratify the agreement, with delegates of the A. C. A. taking part in the action, during all which time the Aero Club was not even a free agent to make such a contract. To save its face it must then charge bad faith on the part of the Council, despite the fact that members of the conference committee are authority for the statement that no such clause as the one sought to be inserted by the Aero Club was ever a part of the agreement.

As has been clearly set forth in past issues of AERONAUTICS, the Aero Club of America never intended that the Council should amount to much more than a name. What little powers it had were allowed it by the Aero Club. Then the Aero Club demanded even the right to say who might and might not be members of the Council. And now, through stupidity, the Aero Club finds that it has no rights itself, so far as concerns the delegation of rights to other bodies.

The National Council has undoubtedly done its duty as it saw it, hindered, and perhaps half blinded, by the dust in the trail of the Aero Club as it has been, only to be deserted at the moment the Council thought it saw a successful outcome of its endeavors.

The only feasible plan for progress from now on seems to be for the Council to again reorganize, eliminate the jellyfish, obtain the cooperation of all the live clubs in the country, draft a set of rules for its future conduct along absolutely independent lines, work diligently with efforts directed towards more rapid progress in the sport and industry, and forget that the Aero Club of America ever existed.

If the Aero Club of America cannot delegate powers, then the National Council must assume its own, or go out of business.

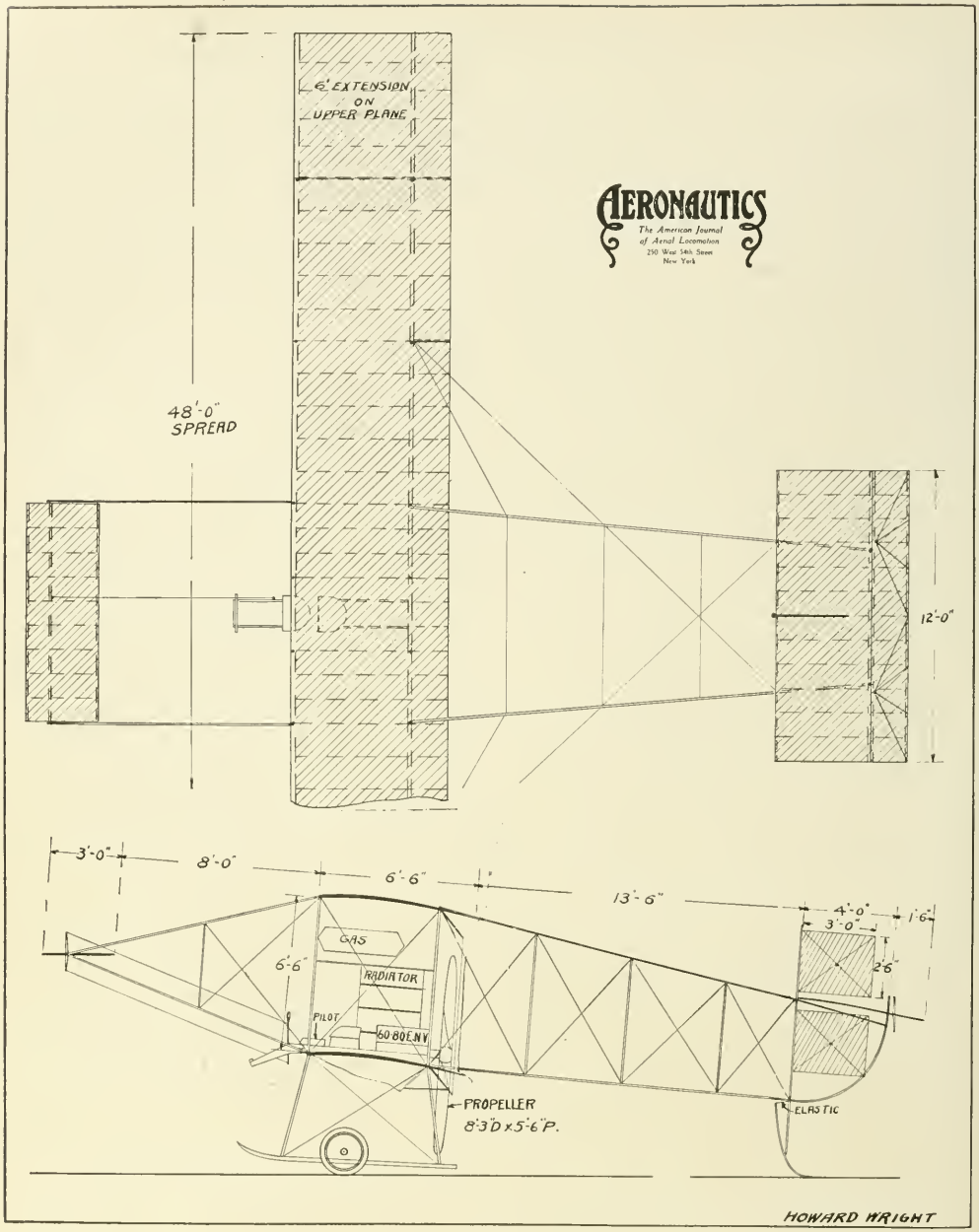
THE HOWARD WRIGHT BIPLANE

THE sketch gives the general dimensions of the Howard-Wright machine as flown by Sopwith. The photograph shows him starting on the flight in which he won the De Forest prize.

The span of this machine has been increased from 36 ft. to 48 ft. by the addition of panels on the upper plane. The planes are single surfaces, and both are fitted with hinged flaps for maintaining lateral stability. They are placed 6 ft. 6 in. apart by means of eight pairs of struts fitting into lugs on the main spars. The front spar forms the leading edge of the plane, the other being about 5 ft. to the rear. They are rectangular in section and are strengthened by a system of wire bracing similar to that which is a feature of the Sommer machine. The ribs of the main planes are spaced equidistant and are inclosed in pockets on the upper side of the fabric. Throughout the machine lugs are used for connecting up the various parts of the framework, and wire bracing is freely used.

The engine and seat accommodation form one unit, being mounted on a couple of stout beams, which are clipped to the main spars of the lower plane. The two radiators are each fastened to the center pair of struts. The gas tank is suspended from the top spars, the lubricating oil tank being mounted above the engine.

As it was necessary for machines competing for the Baron De Forest prize to be entirely British built, the engine is of the latest E. N. V. type of 60-80 horsepower, the bore and stroke being 105 mm. by 110 mm. The special feature of the construction is the use of electrolytically deposited copper water jackets. The complete power plant, including radiators, water, etc., weighs just over 400 pounds. The machine is fitted with a Howard-Wright propeller of 8 ft. 3 in. diameter and 5 ft. 6 in. pitch.



The Howard Wright Biplane

The spherical balloon pilots of the Aero Club of America total 40, and are as follows, in the order in which the licenses were granted:

J. C. McCoy, A. Leo Stevens, Frank S. Lahm, Lieut. Frank P. Lahm, Carl E. Myers, Henry B. Hersey, Alan R. Hawley, Capt. Chas. De F. Chandler, Thomas S. Baldwin, Albert C. Triaca, A. Holland Forbes, Charles J. Glidden, N. H. Arnold, J. H. Wade, Jr., A. H. Morgan, Charles Walsh, A. B. Lambert, Charles Levee, H. E. Honeywell, G. L. Bumbaugh, Dr. R. M. Randall, Carl G. Fisher, John Berry, Wm. F. Whitehouse, Edgar W. Mix, S. Louis Von Phul, Clifford B. Harmon, James Bemis, H. H. Clayton, Roy A. Knabenshue, George B. Harrison, Jay B. Benton, J. Walter Flagg, Wm. T. Assmann, A. T. Atherholt, William Van Sleet, Dr. L. E. Custer, E. S. Cole, Horace B. Wild.

Dirigible pilots total but three: Thomas S. Baldwin, Frank P. Lahm and Horace B. Wild. This list could be added to considerably. Glenn H. Curtiss, Carl E. Myers, Roy Knabenshue are all experienced in dirigible balloon work. Outside of the club, there are Frank W. Goodale, Lincoln Beachey, Chas. K. Hamilton and a half dozen others who have operated small airships for years.

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This Company is ready to make quick delivery of its monoplanes equipped with Anzani or Gnome motors. It guarantees that in workmanship, strength of parts, beauty of finish and in superior materials employed that the product of its factory equals or surpasses the finest aeroplanes manufactured in this country or abroad. The Company has an aviation school on Long Island for the instruction of purchasers or others; and the ability and skill to gain an aviator's pilot license from the Aero Club of America is guaranteed to pupils.

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105	Turnbuckle (straight end)	12 "	.08
100a	Turnbuckle (Samson Lock)	25 "	.11
101	Turnbuckle (Bleriot)	35 "	.16
102	Turnbuckle (Bleriot)	45 "	.19
103	Turnbuckle (Bleriot lock nut)	45 "	.20
104	Turnbuckle (Bleriot lock nut)	55 "	.25
108	Turnbuckle Wrench	10 "	.05
109	One in Post Socket 5/16 Bolt	30 "	.16
110	Oval Post Socket 1" by 15/8	50 "	.30
123	One inch Brass Ferrule	10 "	.05
125	Baby Snap Hooks		.05
128	Combination Outrigger	1.75 "	.90
130	Bed Rail Clamps, 2 inch	35 "	.15
	" " " 4 "	50 "	.20
	" " " 6 "	50 "	.25
134	One-way Terminal	05 "	.03½
135	2, 3 and 4-way Terminals	10 "	.05

Catalogue Number		Regular Price, each	Now
137	Wire or Lock Ferrule	per 100 $3.85 "	$3.50
141	Music Wire, No. 22, 26 and 30 Tinned	per lb. .77 "	.57
142	Stranded Steel Wire Cable 1/16 (500 ft. only)	12.50 "	8.75
149	Same (100 ft. lengths) 3/32	3.75 "	2.65
142a	Steering Cable 1/16 (100 ft. lots)	5.00 "	4.00
142a	Steering Cable 3/32 (100 ft. lots)	6.00 "	4.25
143	Control Wire Guides		.25
144	U Bolts, ⅛, 3/16 and ¼		5, 8, and 12 cts. ea.
148	Aeroplane Covering, per yard		.60 and .80
158	Gibson Propellers		Write for interesting prices
158	" " practice		
160	New York "		
	Aeroplane Wheels 20 by 2	$10.00	$9.00
163	" " 20 by 2¼	11.00	10.00
	" " 20 by 3	15.00	12.50

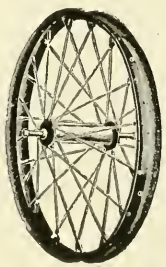
177 Struts (Light) 4½, 5 and 6 ft. Formerly $.70, $.90, and $1.15 **Now 43, 51 and 57 cts. each.**

177 Struts (Heavy) 4½, 5 and 6 ft. Formerly $1.50, $1.95 and $2.25 **Now 50, 57 and 73 cts. each.**

174 Laminated Ribs (Light) 4½, 5, and 6 ft., formerly $.70, $.85 and $1.10. **Now 37, 43 and 50 cents each.**

174 Laminated Ribs (Heavy) 4½, 5 and 6 ft., formerly $1.50, $1.85 and $2.30. **Now 72, 86 and 93 cts. each.**

178 Main Spars, (1 by 1¾) **.10 cents per running foot.**



183 Laminated Steering Wheel, (Curtiss Type). **Now $4.00.**

184 Farman Type Landing Gear complete with wheels and tires, 20" x 2", 20" x 2½" and 20" x 3", formerly $75.00, 85.00 & 105.00 **Now $57.00, $60.00 & $67.00.**

186 Curtiss-Type Running Gear, Complete, all fittings without wheels, formerly $27.50. **Now $19.00.**

187 Aviator Flexible Seat, formerly $12.00. **Now $10.00.**

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DEATH OF LIEUTENANT KELLY, ARMY AVIATOR

THE death of Lieutenant George M. E. Kelly, United States Army aviator, at San Antonio, Tex., on May 10, records the second time an army officer's life has been taken by the Grim Spectre, who now rides the hurricane in more modern style. The other was Lieutenant Thomas Selfridge, who lost his life in 1908.

Lieutenant Kelly took up duties at San Antonio on April 18, after completing a course of instruction at the Curtiss camp in California. A number of flights had been made after that date by Lieutenants Walker, Beck and Kelly, all Curtiss pupils. Lieutenant Beck had had a mishap a few days before and landed in a mesquite tree. The machine was fixed up and Lieutenant Kelly had concluded the first flight made with it since Lieutenant Beck's accident. The grounds at San Antonio are not suitable for practice work, as there are some 20,000 troops camped, and there is no place to start or alight except in the street of the camp. Humidity is low and the winds are bad. In three weeks while Parmalee was flying there, the lowest wind velocity was 23 miles. It is not the velocity, however, but the unsteadiness that makes it bad.

BOARD OF OFFICERS' REPORT.

A Board of Officers, consisting of First Lieutenant Paul W. Beck, Infantry; First Lieutenant B. D. Foulois, Signal Corps, and Second Lieutenant John C. Walker, Jr., 8th Infantry, was detailed to investigate the causes of the fatality.

From the evidence given the Board finds that Lieutenant Kelly had made a flight of approximately 5 minutes' duration, in a Curtiss biplane, at about 7 a. m. May 10, 1911, under good atmospheric conditions. As a result of this flight he met his death.

He had made a not abnormally hard landing. Upon landing, at least one and possibly both sides of seat fork were broken at a point between pilot seat and foot rest. At the same time it appears that one diagonal bamboo brace from front wheel to front elevator was broken, and its mate was bent.

After striking the ground the first time, the machine bounded to a height approximating 10 feet, gradually rising to about 30 feet until, within about 75 yards of the camp of the 11th Infantry, it made a sharp turn to the left, banked up the turning wing, and made an abrupt dive to the ground. Lieutenant Kelly was thrown clear of the machine to a distance of about 20 feet.

As a result of the first impact with the earth, it is apparent that the pilot lost control of the front elevator and therefore had only partial control of the machine.

It is the unanimous opinion of the Board that the front wheel must have struck an abrupt depression in the ground or some obstacle, causing the strain which resulted in the break.

From all of the preceding facts the Board is of the unanimous opinion that the accident was due to the efforts of Lieutenant Kelly to avoid endangering the occupants of the 11th Infantry camp, in which endeavor it became necessary for him to make a sharp left turn, which, in the crippled condition of the machine, put more strain on the controls than would have been required in a straight away landing. Such straight away landing was impracticable, owing to the proximity of the tents.

James Henning, the Curtiss mechanic for the machine that was wrecked, has sent Glenn Curtiss a report at variance with the findings of the investigating board of officers, saying Lieutenant Kelly was at fault in bringing his machine to earth at full speed, and maintaining that speed at a low altitude, so that the end of the low plane struck the ground when he attempted to bank in turning away from tents, whereas if he had flown at an altitude of 100 feet he could probably have landed without accident.

KELLY'S AUTOBIOGRAPHY.

About a fortnight before his accident Lieutenant Kelly wrote a brief sketch of his career for the use of the service. It follows:

Born in London, England, December 14, 1878. Educated at private schools and at Bedford. Had always wished to go into the army, but was unable to afford it, owing to the necessities of a British officer requiring a private income, the pay being too small. Came to the United States in August, 1896. Went to Great Falls, Mont., where two uncles were in business. Engaged in several occupations with little success, except to acquire some mechanical training. At the outbreak of the Boer war tried to join the Canadian Mounted Rifles, but was rejected on account of light weight. Became a naturalized citizen in 1902.

In summer of 1903 went to New York city. While there, hearing that commissions could be obtained through the ranks, enlisted on January 14 in 84th Co., Coast Artillery Corps. Made application to be examined for a commission after two years' service, December, 1905. Passed preliminary examination at New York city in March, 1906, and the final examination at Fort Leavenworth, Kan., January, 1907. Was commissioned in the infantry to date from January, 1907, and assigned to the 30th Infantry. Went to the Philippine Islands with the regiment in July, 1907. Was on detached service for a year on the topographical survey of the Island of Luzon.

Left the Philippines July, 1909, on leave and traveled in China, thence to England by way of Suez. Observed privately the British army maneuvers in the fall of 1909 and returned to the United States December, 1909, and joined the 30th again at San Francisco, and have been there ever since. Was attached to the battalion under J. P. O'Neil at the aviation meet at Selfridge Field. Made an ascent with Walter Brookins and took photographs. Was detailed by the War Department to proceed to San Diego and take instruction in aviation under Glenn H. Curtiss, February, 1911.

All about myself. G. E. M. Kelly, Second Lieutenant, 30th Infantry.

Death of California Aviator.

Addison V. Hartle, of Marseilles, Ohio, was fatally injured by a fall in his biplane on the aviation field near Dominguez, Cal., at 8.10 on the morning of May 17, 1911, and died fifteen minutes later without regaining consciousness.

Hartle was not a member of the Aero Club of California, but was planning to join in order to obtain his aviator's pilot license. The machine was recently taken to the field and on the morning of the 16th, for the first time, he started down the course and made a flight of 3 miles, making two circles and attaining an altitude at one time of nearly 150 feet. A hard landing was made, and the rear strut to the left of the motor was broken. This was replaced by a new one, but the rest of the machine was not properly gone over by him.

The aeroplane is similar in many ways to the one used by Chas. F. Willard in his flight over the cities of Los Angeles and Pasadena in December, 1910, and the hinges on the ailerons are of the same pattern. Half of the hinge is fastened to the plane, while the other half is fastened to the aileron. A small pin is used which locks the two together. The pin is then soldered or else a cotter pin is used, the ends being spread after it is in place. Hartle in his rush to try out the machine evidently did not take the precaution of soldering these pins.

Shortly before eight on the morning of the 17th he started down the course and succeeded in making a circle of 1¾ miles. After making a safe landing he stated to several of the

spectators that he would try and make a figure eight. The aviator started up, and soon after it was noticed that the upper left aileron had become detached from the main plane and was hanging by the control wire. The aileron was being twisted and pulled by the strong rush of air, and finally becoming entirely detached dropped to the ground. Several signaled and shouted to him to come down, and he headed toward the ground after flying nearly 3,000 feet without the upper left aileron.

He was but two feet from the ground when he started up again, evidently thinking that everything was O. K. Before many seconds he was at a height of about 40 feet, when the machine suddenly swerved to the left. The control being useless on that side, the operator was unable to right it, and the huge plane dashed to the ground. Hartle passed away without regaining his senses.

Among those present who witnessed the accident were C. Crosson, J. Gage, Wm. Stevens and J. Waite.

Bournique and Companion Killed.

RHEIMS, France, May 18.—A monoplane (R. E. P.) carrying Lieut. Paul Dupuis and Pierre Marie Bournique, speed record holder, fell from a height of about 250 feet to-day. Dupuis was killed and his companion, mortally injured, died shortly after.

The machine was capsized by a squall and burst into flames the instant it struck the ground.

The body of the Lieutenant was burned beyond recognition. Bournique's arms were fractured and his legs badly burned.

Two Russian Aviators Killed.

SEVASTOPOL, May 1.—The Russian military aviator Matievitch and his brother were killed to-day while making an aeroplane flight.

German Aviation Pupil Dies.

JOHANNISTHAL, May 11.—Hans Bockemuller, an aviation pupil, was killed when his aeroplane crashed against a building that had been hidden from the view of the pilot by a heavy early morning mist. The aviator had been maneuvering in the military field at Johannisthal, Ger., and unconsciously flew over the inclosing fence, and had no time to save himself when the building suddenly loomed ahead. The Poulain monoplane was wrecked.

Frenchmen Killed in China.

SHANGHAI, May 6.—Rene Vallon, 31 years old, a French aviator, fell from a great height to-day and was instantly killed.

Vallon belonged in Paris, and had been giving exhibitions in this country for six weeks in the hope of interesting the Chinese Government in military aviation. He made the first extended flight by an aviator in China, using a Sommer biplane.

Aviation Learner Killed.

CHALONS, France, April 20.—Louis Liete, an aviation pupil died to-day from injuries received in a fall from a height of about 15 feet a few days ago.

Chicago Aviator is Dead.

BATON ROUGE, La., April 22.—William A. Purvis, of Chicago, who fell with a Gates biplane March 5 last, is dead at a hospital of his injuries. Purvis fell beneath his engine, the weight of which drove a wooden stave through his hip. The body was taken to Chicago for burial. Mrs. Purvis was at the bedside.

Aviation Pupil Killed.

LONDON, May 25.—An aviation pupil named Benson was killed at Hendon to-day.

An aeroplane, which he was piloting, capsized while he was imprudently attempting to glide to the ground.

German Flyer Falls.

MULHAUSEN, Germany, May 2.—Lieutenant Raser of the German army, who recently obtained an aviation pilot's license, fell with his aeroplane from a height of 150 feet to-day and was so seriously injured that there is no hope of his recovery. His machine was smashed to pieces.

AUTO CLUB MOTOR PRIZE

(*Continued from page 203*)

Item D.—That motor which shows the greatest horsepower output at the drive shaft (average throughout three-hour test) per pound weight (of motor and all accessories) shall receive 25 points. Other motors shall receive under this item points in proportion as they develop horsepower per unit weight as compared to the horsepower developed by that motor which develops the greatest horsepower per pound weight (of motor and all accessories).

Item E.—That motor which develops the greatest brake horsepower per pound weight, per 100 revolutions per minute, of the drive shaft (average throughout three-hour test) shall receive 10 points. Other motors shall receive under this item points in proportion as they develop horsepower per pound weight, per 100 revolutions per minute, as compared to the horsepower developed by that motor which develops the greatest horsepower per pound weight, per 100 revolutions per minute.

Item F.—That motor which vibrates least shall receive 15 points. Other motors shall receive points under this item in inverse proportion to the amount of vibration which they develop, as compared to that motor which vibrates least. The vibration shall be measured while the motor is running at the declared speed, under load (i. e., at that speed at which the entrant elects to make the three-hour test), and shall be determined during a short test following the three-hour test.

Item G.—That motor which consumes the least lubricant per brake horsepower hour (average throughout three-hour test) shall receive 5 points. Other motors shall receive points under Item G in proportion as they show economy in lubrication per brake horsepower hour as compared to that motor which shows greatest economy in lubricant.

A cash prize of one thousand dollars ($1,000) in gold will be awarded to the competitor whose motor secures the highest number of points according to the scale given above. The prize shall not be awarded if no motor runs continuously for at least three hours, at what the committee considers a satisfactory load and speed.

OPEN FOR ENGAGEMENT.

Listing in this column is free. State qualifications, kind of machine, permanent address and experience at flying, giving places where flights were made.

CAPT. THOMAS S. BALDWIN, Box 78, Madison Sq. P. O., New York, Baldwin biplane. Pilot A. C. America.

CURTISS AEROPLANE CO., 1737 Broadway, New York, Curtiss biplanes.

WM. EVANS, 2024 Agnes Ave., Kansas City, Mo., Greene biplane and Lovelace monoplane.

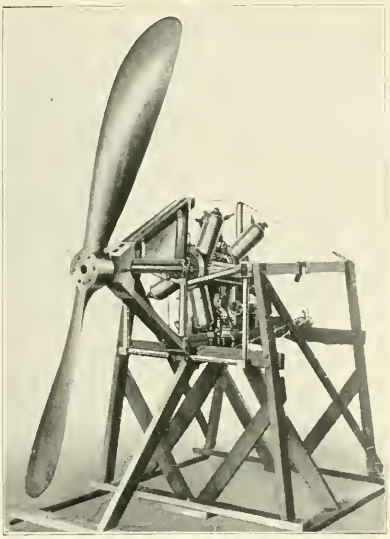
WALTER JOHNSON, care Thomas Brothers, Bath, N. Y., Thomas biplane.

LADIS LEWKOWICZ, 51 West 84th St., New York, Bleriot monoplane. Pilot A. C. France.

STARLING AVIATORS, Washington Park, East St. Louis, Mo., biplanes.

THE WRIGHT CO., Dayton, O., Wright biplanes.

GEORGE YAGER, 119 N. 15th St., Omaha, Neb., dirigible balloon.



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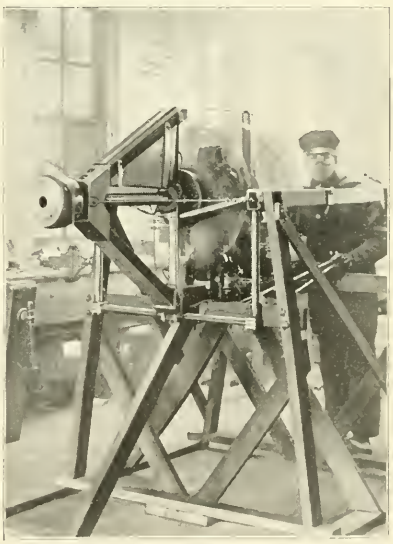

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Geo. Schmitt Flying at Mineola.

FLIES WITH TWO-CYLINDER MOTOR.

RALPH L. BRAY, of Long Branch, New Jersey, has built a very interesting machine of a modified Curtiss type with a great many original details of construction. Instead of using solid sections for the main beams and outrigger spars, he has built up spars from two pieces of ½ by 1½-in. spruce, held apart by blocks every 12 in. The spread of the machine is 30 ft., the end panels of the lower plane being left off, making the lower plane 20-ft. spread. The depth of the planes is 5¼ ft., curvature being 4½ in., situated one-third back from the front edge. The ribs are of the double type, running under and over the beams, each strip being ½ by ⅜ in. These strips are held apart by blocks, glued and riveted every 12 in. The main planes are made in three sections, joining with a steel sleeve, making a very quick way of setting up. The uprights are also of novel construction, being made of two pieces of ½ by 1½ in., separated in the middle by a distance piece 2½ in. long, the ends being glued and riveted together and fitting into an ordinary socket.

The rear wheels are set about 4 in. in front of the rear beam, instead of directly under, the track being 5 ft. The tires are Hartfords.

The elevating planes, which are double and 7 by 2½ ft., with a curvature of 1 in., are pivoted 12½ ft. in front of the main planes. The rear surface, which is fixed, is situated 15 ft. behind the rear spar. The vertical rudder is 30 by 36 in.—of ordinary Curtiss construction and operation. The ailerons are 10 ft. by 30 in., of double rib and cover construction, operated by the usual Curtiss shoulder brace. The outer end of the aileron is supported by a triangle from the top plane, and a slanting rod from the lower.

Power plant is the 2-cylinder 20-30 h.p. Detroit Aero, which turns a 7-ft. propeller, developing a thrust of 180 pounds. The engine is set low enough to obviate the necessity of cutting a notch in the upper plane.

Mr. Bray states that while out one day cutting grass, he opened the throttle a little too far and got off the ground before he was aware, and in trying to dodge a flock of crows he turned too short and caught the end of his wing, causing a little damage, which was, however, easily fixed.

BABY 12-H.P. BIPLANE FLIES.

Otto Hermann, of Providence, R. I. has built and nown a machine which is of particular interest in that it is a considerable departure from the usual practice of building Curtiss copies. Light weight and small power are the principal features, the machine with everything on board, including the aviator, weighs 290 pounds. The machine without the motor weighs but 160 pounds.

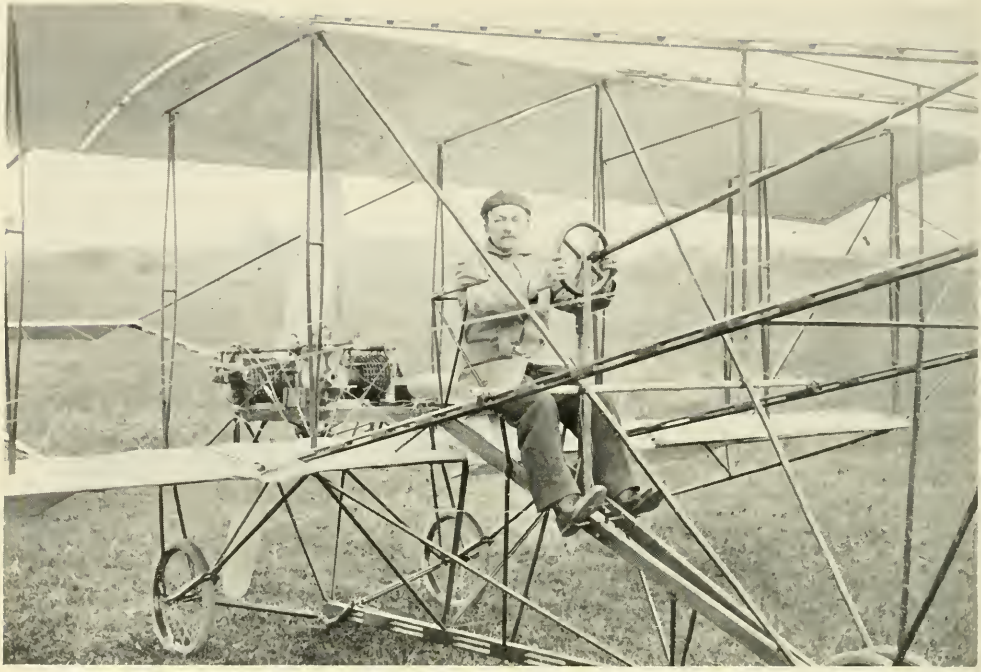
Main Planes.—The main planes have a spread of 24 feet, and a chord of 3 feet 10 inches. The separation is 4 feet 1 inch. The depth of curvature of the planes is greater than the usual practice, being 5 inches maximum. This is situated 14½ inches from the leading edge. The angle in flight is stated to be 7 degrees. The front beam, which is of elliptical section, is 1¼ by ½ inches. The rear beam is also of elliptical section, 1½ by ¾ inches, and is situated 3 feet to the rear of the front one. The ribs are ½ by ½ inch, spaced 18 inches on centers; they pass over the rear spar and are attached to it by sheet steel couplings. The cloth for the surfaces, which was prepared by Mr. Herrman, is tacked on the top of the ribs, a heavy tape being used to keep the cloth from tearing. A wire is run in a pocket along the rear ends of the ribs.

Running Gear.—Three Premier 29-inch wheels are used, two being situated under the front of the planes, the third being under the tail. A skid was used at first under the tail, but as this gave considerable braking effect the wheel was substituted.

Power Plant.—A two-cylinder 12-H.P. Indian engine, equipped with an Indian magneto and a Hedstrom carburetter, is used.

The propeller, which is direct connected, was made by Mr. Herrman, and is 5 feet diameter, with a 3¼-foot pitch. The engine turns it 1,100 revolutions per minute.

Controls.—The elevator and tail plane work in conjunction. The method of operation being similar to that used by Farman. The front elevator, 6 feet 5 inches by 2 feet 2 inches, is 8 feet in front of the main planes. The



Ralph L. Bray in His Novel Machine. Note the Peculiar Struts and Outriggers.

rear surface, 6 feet 1 inch by 2 feet 8 inches, is 12 feet to the rear of the front of the main plane. The elevators are double, covered with the same cloth used on the main surfaces.

The rudder, which is 4 feet by 2 feet 2 inches, is 7 feet to the rear of the main planes.

Lateral stability is secured by the use of ailerons, 6 feet by 2 feet 2 inches, hinged on the rear struts midway between the planes. These are operated by a sideways movement of the elevating lever.

J. J. LONG.

NEW MACHINE FLIES IN BALTIMORE.

Edward B. Brown, president of the Brown Aeroplane Co. of Baltimare, which has recently been formed to build machines, finished his second machine and gave it its trial flight on May 17. Antony Jannus, although new to this machine, was familiar with the Emerson engine, with which the aeroplane was equipped, and was induced to try it out. Two successful flights were made, one out over Patapsco basin. The new four-cylinder two-cycle engien was used in this, rated at 65 h. p. The machine spread 32 feet and weighs around 800 pounds.

NEW AMERICAN RECORD.

Frank Coffyn and Lieut. B. D. Foulois flew the Wright machine on its official army test, April 27, for 90 minutes, creating a new American two-man endurance record. The old record was made by Orville Wright, 1 hr. 12 min., July 27, 1909.

NEW QUEEN MONOPLANE FLIES.

Arthur Stone, monoplane pilot of the Aero Club of America and the Aero Club of France, has been doing some fine flying with the new Queen monoplane, which has quite suddenly and quietly appeared on the American market. The first two machines have been out but a week and already aviation "fans" are com-

Otto Hermann's Biplane

JUST PUBLISHED

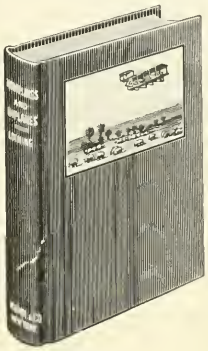
A New and Authoritative Book

MONOPLANES and BIPLANES

Their Design, Construction and Operation

The Application of Aerodynamic Theory, with a Complete Description and Comparison of the Notable Types

By GROVER CLEVELAND LOENING, B. SC., A. M.



AVIATION is a predominant topic in the mind of the public, and is rapidly becoming one of the greatest goals of development of the progressive engineering and scientific world. In the many books that have already been written on aviation, this fascinating subject has been handled largely, either in a very "popular" and more or less incomplete manner, or in an atmosphere of mathematical theory that puzzles beginners, and is often of little value to aviators themselves.

There is, consequently, a wide demand for a practical book on the subject—a book treating of the theory only in its direct relation to actual aeroplane design and completely setting forth and discussing the prevailing practices in the construction and operation of these machines. "Monoplanes and Biplanes" is a new and authoritative work that deals with the subject in precisely this manner, and is invaluable to anyone interested in aviation.

Mr. Loening, who has come in intimate contact with many of the most noted aviators and constructors and who has made a profound study of the subject for years, is unusually well informed, and is widely recognized as an expert in this line. In a clear and definite style, and in a remarkably thorough and well-arranged manner he has presented the subject of aviation. The scientific exactness of the valuable data and references, as well as the high character of the innumerable illustrations and diagrams, renders this work easily the best and the most useful, practical and complete that has ever been contributed to the literature on aeroplanes. Following is a table of the contents:

PART I.

The Design of Aeroplanes

Chapter I. Introduction. II. The Resistance of the Air and the Pressure on Normal Planes. III. Flat Inclined Planes. IV. The pressure on Curved Planes. V. The Frictional Resistance of Air. VI. The Center of Pressure on Flat and Curved Planes. VII. The Effect of Depth of Curvature and Aspect Ratio upon the Lift and Drift of Curved Planes. VIII Numerical Example of the Design of an Aeroplane.

PART II.

Detailed Descriptions of the Notable Aeroplanes

Chapter IX. Introduction. X. Important Types of Monoplanes. XI. Prominent Types of Biplanes.

PART III.

Comparison of Types

XII. Comparison of the Prominent Types. XIII. Controlling Apparatus. XIV. Accidents. XV. The Variable Surface Aeroplane. Index.

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PROOF MATERIAL

menting on the fine construction and the good flights that have been made at Belmont. The machines are being manufactured by the Queen Aeroplane Company, located at Fort George Park, 197th street and Amsterdam avenue, New York City, which has equipped and is operating a most thoroughly modern and up-to-date aeroplane factory.

The company is building monoplanes which in detail of construction, in use of metal materials, and in careful workmanship are not surpassed either in this country or abroad.

The factory and the assembly rooms are in the old amusement palace of the Fort George Park and the extensive buildings connected thereto are crowded with monoplanes in various stages of completion.

The company states it has just taken a contract to construct for the American representatives of M. Nieuport 10 Nieuport aeroplanes. These will be turned out at the rate of one a week, in addition to the factory's usual output of Queen monoplanes. The Queen machines can be obtained with either Gnome or Anzani motors. An aviation school has been established where instruction may be had at a reasonable figure under Mr. Stone's supervision. Pilot licenses are guaranteed to students. Exhibition dates will be accepted.

28-MINUTE FLIGHT WITH SMITH MACHINE.

Abram Raygorodsky (nicknamed "Ratherrisky"), an imported licensed aviator, did not succeed in doing any very sensational flying with the Rex Smith machine in Washington, so Antony Jannus, who has been doing most of the flying with this machine, took it out for a real airing for 28 minutes on May 14.

The Smith company is now building a new machine in which the ribs vary, decreasing in depth of curve from the center panel toward the extremities of the planes. In the center it is about 4 feet deep, and at the extremities almost flat. A Hall-Scott engine has been ordered for it, and the new Berliner rotary, of which a description has already appeared in AERONAUTICS, will also be tried.

NOVICE IS BIG SURPRISE.

The Shneider school biplane which has been at Belmont for the past month making short flights was fitted with a new Roberts motor and on May 24 Joseph Richter, who had never before been more than 50 feet from the ground, circled Belmont track on first attempt with the new engine and flew for just over a quarter of an hour at an altitude of 700 to 800 feet. Shneider was on his way to the track when the machine was recognized by him as his own, passing high over his head.

Another flight was made later in the day over to Mineola. Not being acquainted with the grounds and unable to find the magneto switch when he wanted to land, a couple of ribs were broken, and a wheel.

Hadley and Blood, agents for the motor, took this particular one out of their own machine for use until they could get a new one from the factory.

Frank Fitzsimmons, instructor of the Aeronautic School of Engineers, has been out 'grass cutting" with one of the machines made by students of the school. It is a Curtiss type, of the older style, and is fitted with an Elbridge "Featherweight" engine. On May 21 he made a number of flights for the edification of the young ladies who were specially invited to make the function a ladies' day.

Louis Rosenbaum has been doing some flying with his Curtiss-type machine.

Geo. L. Schmitt, a high school boy of Rutland, Vt., has been doing good novice work at the Mineola field during the past month with his Curtiss-type machine equipped with an Elbridge 40 h. p. "Featherweight" and Gibson propeller. He has been making circles and figure eights and has enjoyed freedom from the accidents which have been met with by the other amateurs. The machine was built by Wittemann. He was scheduled for an exhibition flight in his home town last fall and the machine arrived only the day before. He had to make good on his exhibition with his first flight.

Hadley and Blood, after having made some short flights with the new Roberts motor over which they are most enthusiastic, are reducing their big and heavily built Farman type to lessen head resistance and weight. The machine is a very large size and the Roberts motor looks extremely small. It seems to be asking a great deal of the engine to fly such a big machine. But it does it, and the motor has received favorable comment.

F. Raiche has been teaching some pupils how to cut grass with his Curtiss-type fitted with a 4-cylinder Fox engine. Mrs. Raiche has made some short "jumps."

"Willie" Haupt, the automobile racing driver, has been making some good flights with his Bleriot XI which was imported by John Wanamaker.

Joe Downey in a Bleriot-type and Joseph Stevenson in a Curtiss-type have been making short flights.

Photo by Spooner and Wells

Earle Ovington in His New Bleriot. Note Wind Shield, Map Holder, Landing Gear and Inverse Curve of Elevator.

The Brauner machine, now at Mineola, has made some very fine flights, and on one occasion had Capt. Baldwin as its pilot.

An exact duplicate of the above has been shipped to Messrs. Avcue & Estrade, of Cuba, who intend to tour Cuba, Porto Rico, Santa Domingo, Panama, Mexico and Central America, giving exhibition flights in each place.

JOHNSTONE WINS TROPHY.

St. Croix Johnstone, of the Moisant Aviators, flying a Bleriot, on May 22, won the silver trophy offered by J. J. Lannin, proprietor of the Garden City Hotel, for the first aviator who should fly three times around the Mineola aviation field and then encircle the Garden City Hotel and the cathedral.

OVINGTON HEMPSTEAD STAR.

Earle L. Ovington, former head of the Federation of American Motorcyclists, Boston "Tech" graduate, electrical engineer, and motor expert, is one real flier.

On April 29 he flew for 45 minutes, starting from Belmont Park, where he has his shed, out over Mineola and Garden City, back over Nassau Boulevard, where a large number of members and friends of the new Aero Club of New York were gathered to witness the previously announced flight. A very strong wind was blowing. A sheet had been spread out for the guidance of the aviator, as he was to make a landing at Nassau, but he was too high to distinguish it and finally landed back at Belmont.

On May 17 three flights were made, two of which were cross country to Mineola and around the Cathedral at Garden City, totalling in all 94 minutes.

On May 21 Ovington flew 32 minutes, visiting Hempstead and Mineola, while Beachey flew the Baldwin machine and Houpert the Moisant school Bleriot for 25 minutes each.

AEROPLANE RIFLE LATEST.

An interesting test of the "Autoloading Rifle," of the Remington Arms Co., was made at the Bridgeport meet on May 13. Lieut. Fickel, U. S. A., who was detailed by Washington for the purpose, went up with Beachy in a Curtiss biplane for a short flight. Army officers have been anything but satisfied, it is said, with the results obtained with the service rifle, and the flight was planned as a test of a repeating arm other than Government make.

A six by twelve target was spread on the field, and after a short preliminary run Beachy signalled Lieut. Fickel to get in. The extra planes usual in passenger carrying were lacking, and the strong wind made extended flying difficult.

Lieut. Fickel was able to throw three shots into the target, which is a remarkable record considering the speed at which he had to work. In an interview after the demonstration, Lieut. Fickel said that he found the speed and accuracy of the new Remington UMC .25 autoloading rifle a distinct advantage over the Springfields he had previously used in tests, and that he considered the "Autoloader" the only practical gun for use under such conditions.

The rifle is designed to allow five shots, deliberately or rapid fire. As in the majority of self-loading rifles, part of the recoil, ordinarily absorbed by the shooter's shoulders, is utilized to operate the mechanism. The rifle used is, however, nearer the military model than the average self-loader, the cartridge being locked in the firing chamber by a locking bolt until after the bullet has left the muzzle.

YACHTSMAN BUYS WRIGHT 'PLANE.

A Wright machine will be delivered at Mineola within a few days for Alex. Smith Cochran, of 10 East 41st St., New York, a well-known New York clubman and sportsman, especially in the yachting world. He is the owner of the yacht "Westward," which last year cleaned up all competitors in European waters, including the Kaiser's "Meteor." Mr. Cochran is a very wealthy man, being the principal owner of a large carpet mill at Yonkers, N. Y.

News In General

BARRIER GETS HAVANA PRIZE.

The Havana City Council has formally awarded the prize of $3,000 for the fastest flight from Camp Columbia to and around El Morro to Rene Barrier, of the Moisant aviators. Barrier beat McCurdy's time by 1 minute 31 seconds, despite the fact that McCurdy did not follow the course but cut off about a mile each way, because he flew over the beach and not across the city. It was for this violation of the rules of the contest, the Moisant aviators are officially informed from Havana, that McCurdy's protest was disallowed and the prize awarded to Barrier.

AERO CLUB TO LEAVE BELMONT.

If the new bill before the New York State Legislature, providing for relieving of directors, officers, etc., of jockey clubs of liability where gambling is discovered on the premises, passes, as is confidently expected by devotees of horse racing, the Aero Club of America will find itself with Belmont Park unavailable for aviation. Since the meet last Fall, the Westchester Racing Association has allowed members of the Aero Club and others to occupy the sheds and use the grounds for flying at a nominal rental. The fences, which were taken down for the meet, have been put up some time since and flying restricted to only certain hours. The Belmont track will probably see the first of horse racing when revived and it will be impossible to permit flying.

FARMAN TO BUILD IN AMERICA.

The "Farman Company of America" is the corporation, organized in New York State, capitalization $500,000, with directors Henry Farman, Alfred W. Lawson, editor of "Aircraft," and Baron Ladislas D'Orcy, by which Farman biplanes will be produced in the United States.

Both the Farman brothers, Henry and Maurice, are represented as stockholders. Suitable grounds are now being looked up and it is promised shortly that Farman's chief engineer will be over to superintend the erection of buildings and stay for six months to train American mechanics into French methods.

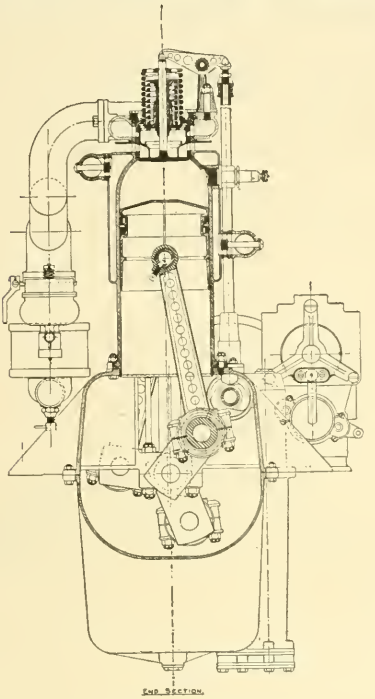
AERO PROMOTER DISAPPEARED.

Dr. Sidney Mathews, alias Harry Bretton and several other names, who succeeded in interesting people with money to develop an aeroplane, the model for which he built while a prisoner in the Queens county jail, has disappeared. He was released from the jail October, 1910, on $5,000 bail, supplied by Mrs. Van Buren Holmes, of Edgemere, L. I., pending an appeal from life sentence.

When Mr. Bretton once got outside the jail gate he and his friends organized the American Aero Safety Car Company, with headquarters in Richmond Hill, L. I. He soon disguised his identity by taking the name of Dr. Mathews, general manager of the concern.

Dr. Mathews represented to prospective customers that his machine was a wonder, but hesitated repeatedly to show his machine to people. In very flowery language he would explain that his was an all metal biplane, weighing 1,900 pounds, and could be bought for $12,000. It was to have been propelled by two motors with what he called a "complex" propeller. Both the Bretton aeroplane and Dr. Mathews are now missing.

Kirkham Motor



END SECTION.

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Note the symmetry of design and the sturdy construction, which in connection with the high class material and workmanship employed and the Motor Knowledge that the Designer has put into this motor, makes it The Motor **YOU** ought to have in your plane if you want **RESULTS.**

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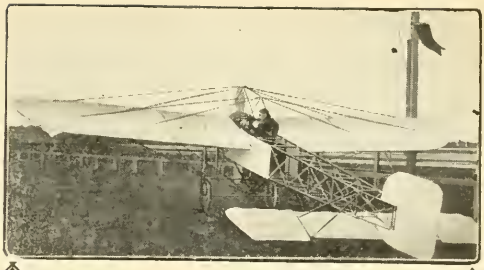

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Material; absolutely the best obtainable and subjected to rigid inspection and tests before using.

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Complete Working Drawings and Instructions
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Several newspapers, individuals and magazines, interested in cleaning the "game" of fakes and misrepresentations, have for some time been gathering information as to such concerns, and the above was recently exposed by the New York *World*.

An exclusive dispatch from San Francisco states that Director Cleve T. Shaffer, of the Pacific Aero Club, is raising a moustache. Go to it, Cleve, and put one over on Glen H.

AEROPLANE MAKERS ORGANIZE.

The Aeronautical Manufacturers, Association was incorporated under the laws of Connecticut on April 21 and membership corporation and papers filed with the Secretary of State, Ernest L. Jones, Frederick D. Wood, Alfred W. Lawson, Stanley Y. Beach of New York and S. E. White of Bloomfield, N. J., were named as incorporators. The headquarters of the association are at 1737 Broadway, New York.

NEW COMPANIES.

Lundgren Aeroplane Co., Youngstown, Ohio. Robert Wilson and others, $10,000.

National Aerial Navigation and Equipment Co., Cullman, Ala. Fred J. Buckmann, president. Recently reported incorporated with $125,000 capital stock.

Dillon Aviation Co., $25,000, Dillon, S. C. W. Murchison, F. M. Rowe and J. E. Manning, incorporators.

Strobel Aviation Co., Toledo, O.

L. E. Schlotterback Manufacturing Co. Capital, $500,000. The registered office is at 26 Munn avenue, East Orange, N. J., and the incorporators are L. E. Schlotterback, East Orange, and Charles F. Landmesser and William A. Wachenfeld, both of Newark.

The Arbogast Aero Co., Anderson, Ind. Capital stock, $10,000, to manufacture air craft. Directors, Ernest W. Daniel and John R. Arbogast.

The Chickasha (Okla.) Aeroplane Co. Capital stock of $15,000. C. C. Kirkpatrick, secretary of the Chamber of Commerce, is secretary and treasurer.

The Aviation Field, at Clason Point, N. Y., capital of $10,000, to manufacture and deal in aeroplanes, monoplanes and other paraphernalia relative to air craft generally. Directors, Thomas E. Coffey, Joseph A. Oakes, William J. Dailey, Brooklyn, N. Y.

Kuhnert Aerial Construction Co., Hackensack, N. J. To manufacture flying machines. Capital, $100,000. Incorporators, Frederick Kuhnert, Matthew Andronico, Lester Gilbert, Hackensack, N. J.

Dyeoplane Co., Newport, R. I. Capital of $50,000, divided into 1,000 shares of $50 each. The incorporators are Cleveland H. Dye, with 514 shares, and J. Frank Dye and E. P. Tyler, each three shares. The machines will be built under patents secured by the Dye brothers.

Iowa Aeroplane Co., Fort Madison, Ia. M. H. Schwarzenburg, manager, and J. F. Coulson, secretary.

Mattery Aviation Co. Capital, $2,400. Manufacturing and selling aeroplanes and biplanes. Incorporators, William A. Mattery, N. C. Collins and Frank H. Holmes.

The Clark Airship Co., Cleveland, Ohio. The company will develop the ideas of William H. Clark, 4009 Woburn avenue, S. W., an inventor who has patented a screw propeller that he believes will revolutionize the airship field. The incorporators are William H. Clark, Jacob H. Levy, J. A. Bommhardt, W. G. Fording and E. J. Hobday.

Hamilton Aviation Co., New Britain, Conn. Capital, $75,000. The company is composed of Chas. K. Hamilton and his wife, Mr. and Mrs. J. B. Beadette, Mr. Hamilton's stepfather and his mother, and Thomas W. O'Conner. The company is for the purpose of manufacturing, exhibiting, selling and buying aeroplanes.

The Sumner & Dreyfuss Co., of New York City, incorporated to manufacture and deal in aeroplanes, balloons and airships. Its capital is $5,000, and has the following directors: George Sumner, Nathan A. Dreyfus, Donald B. Abbott.

Iowa Aeroplane Co., Keokuk, Ia.

International Aeroplane Manufacturing Company, Chicago. Capital stock, $2,500. Manufacturing and dealing in aeroplanes and conduct school of aviation. Incorporators—Samuel D. Dixon, Arthur Sanderson, William E. Johnson.

NEW BOOKS.

MONOPLANES AND BIPLANES, by Grover Cleveland Loening, B.Sc., A.M. Cloth, 8vo, 340 pp., illustrated. Published by Munn & Company, Inc., 361 Broadway, New York, at $2.50 net.

The book is divided into three parts. Part 1. THE DESIGN OF AEROPLANES. This includes: Historical Introduction, The Resistance of the Air and the Pressure on Normal Planes, Flat Inclined Planes, The Pressure on Curved Planes, The Frictional Resistance of Air, The Center of Pressure on Flat and Curved Planes, The Effect of Depth of Curvature and Aspect Ratio Upon the Lift and Drift of Curved Planes, Numerical Example of the Design of an Aeroplane. Part 2. DETAILED DESCRIPTION OF THE NOTABLE AEROPLANES. This includes: Definition of Terms, Important Types of Monoplanes, Prominent Types of Biplanes. Part 3. COMPARISON OF THE TYPES. Comparison of the Prominent Types, Controlling Apparatus, Accidents, The Variable Surface Aeroplane.

This book deals with theory only in its direct relation to the design of an aeroplane. It is all set forth in a very clear and concise manner and is very well arranged. The drawings and the diagrammatic representations of the various control systems are excellent. It is a book that will be appreciated by the experimenter and student as well as those who have less technical knowledge. It is, as far as we know, the first time that the results of various investigators have been gathered together and compared. These comparisons will do a great deal toward clearing up points that have bothered the experimenter. The tables of the loadings and the weights per horse power of the various machines are instructive.

THE NEW ART OF FLYING, by Waldemar Kaempffert. Cloth, 8vo, 291 pp., illustrated. Published by Dodd, Mead & Co., 4th Ave. and 30th St., New York, at $

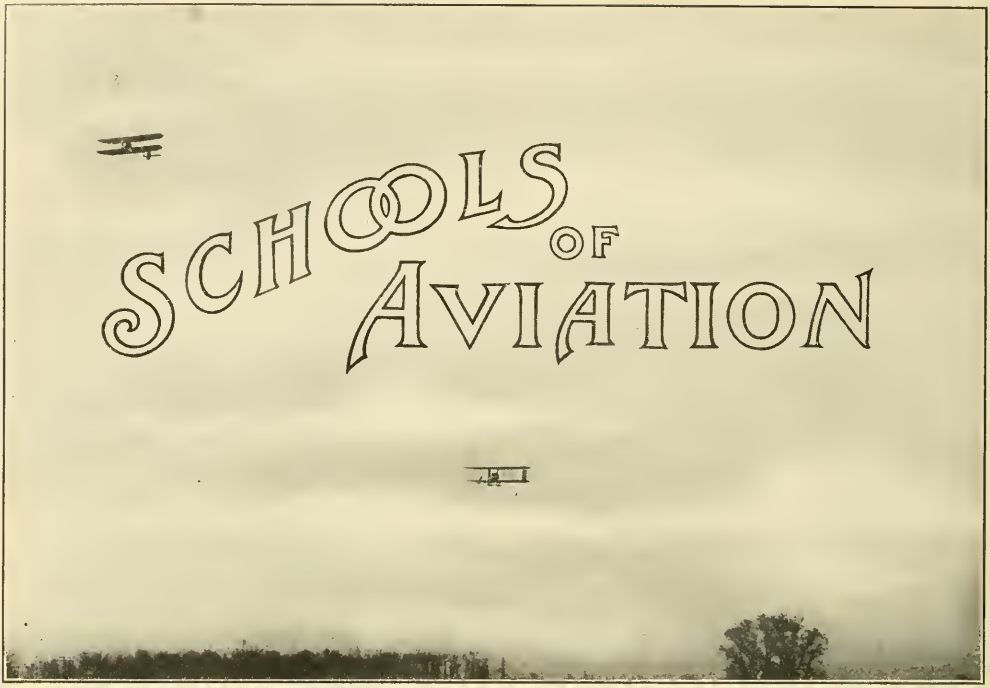
The contents include: Why Flying Machines Fly, Flying Machine Types, The Plane in the Air, Starting and Alighting, How an Aeroplane is Balanced, Making a Turn, The Propeller, Aeroplane Motors, The New Science of the Air, The Perils of Flying, The Flying Machine in War, Some Typical Biplanes and Monoplanes, The Flying Machine of the Future, The Law of the Air.

This book should appeal to the "man on the street," just touched with an interest in the new art, who wants to know why aeroplanes fly, the history of aviation, accomplishments and application, without wading through scientific treatises. It will be of little value to the experimenter and student of the art and science.

DICTIONARY OF AVIATION, by Robert Morris Pierce. 16 mo, cloth, 287 pp. Published by the Baker & Taylor Co., 33 E. 17th St., New York, at $1.45.

The subjects covered by this dictionary include aerostation and aviation, bird flight, ornithology, astronomy, geography, etc. To those constantly using aeronautical terms, the book will be found of considerable interest, particularly as there are words and expressions therein which certainly have never before been seen in print or heard used.

There is a necessity for a proper dictionary of aviation, but certainly this one might better have been left in manuscript form. After various national and international bodies have adopted certain words and definitions, it seems rather unnecessary that an author should go out of his way to print definitions according to his own liking rather than according to the accepted rule. There are enough alleged works on aeronautics published, and about to be published, for infliction on a long-suffering public to make it unnecessary that those interested in aeronautics be asked to purchase another book of as little value as this one.



Pupils Flying at the Wright School.

THE exhibition business will probably begin to die out by the end of 1911. This seems to be realized by nearly everyone who is conversant with this branch of commercial aeronautics and it is expected that another year will see flying on almost wholly a sporting basis, with meets and races purely competitive. There is little in the way of exhibitions abroad and there is much in the way of race meets and long distance contests.

Schools of flying are doing well abroad and this year schools have been started in America. The Wright and Curtiss companies have trained a number of pupils, army officers, sportsmen and professional aviators. A. J. Moisant has had a school in operation for a month past and the Burgess Company & Curtis have more than half a dozen pupils to teach. Still more schools are springing into activity and it is very likely that the list of competent aviators will be increased by fifty or more this summer.

At the Wright School.

Two machines are continually flying at the Dayton field of the Wright company. Two hundred and ninety-two flights have been made between March 11 and May 15, and the following men have been trained: Lieut. John Rodgers, 2nd Lieut. W. De Milling and 2nd Lieut. Henry H. Arnold, of the U. S. Navy, as well as three aviators for the company's work, Howard W. Gill, of Baltimore, who built and flew a Curtiss-type at the first Los Angeles meet a year and a half ago and then removed to the St. Louis fields; L. W. Bonney, of Wellington, O., and Oscar A. Brindley, of Columbus, O.

Orders have been received which will tax the capacity of the plant for the next three months. During the three months one machine was at Augusta in charge of Frank Coffyn; 135 flights were made, with a total duration of 32 hours. Three or four of them were cross country. The total repair bill was but five dollars. During this time three men learned to fly and gave frequent exhibitions. This should go a long way to prove that flying, with good judgment, can be carried on at small expense.

At Hammondsport.

The Curtiss Aeroplane Co has a number of pupils at Hammondsport, N. Y., and a slow-flying practice machine is being used. This, however, has increased lifting power and carries two people with the four-cylinder engine.

Ladis Lewkowicz Opens School.

The "French School of Aviation" is the title of the school inaugurated by Ladis Lewkowicz, pilot aviator of the Aero Club of France, at Nassau Boulevard, L. I., N. Y., the new grounds being put in shape by the Garden City Estates Co., of which the Hon. Timothy Woodruff is head.

The school is to follow closely the line of the Bleriot schools as to regulations, etc. A genuine Bleriot type XI is being used, the same with which Mr. Lewkowicz flew in France last year while he was abroad studying and investigating European methods. Tuition fee is $500, the standard price adopted here. Three hundred dollars is deposited to cover possible damages. A special offer is being made for the first twelve pupils at a price of but $250.

The Baldwin School.

Captain Thomas S. Balwin is now in a position to accept students of flying at $500 a course, using his new all-steel biplane with Hall-Scott engine. This new machine has proved too speedy for pupils and it is being slowed up for school work. For the present the grounds at Mineola are being used but it is likely that a change will have to be made in the near future to other but nearby fields on account of arrangements that have been made by the owners of the present fields for leasing to A. J. Moisant.

CURTISS AEROPLANES

WINNER of the first Gordon-Bennett International Race.
WINNER for three years of the Scientific-American Trophy.

FAMOUS FOR Flight from Albany to New York by G. H. Curtiss; from New York to Philadelphia and return, C. K. Hamilton; Key West, Fla., to Havana, Cuba, J. A. D. McCurdy; to and from the Cruiser Pennsylvania, Eugene Ely.

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N. Y. Office: 1737 Broadway

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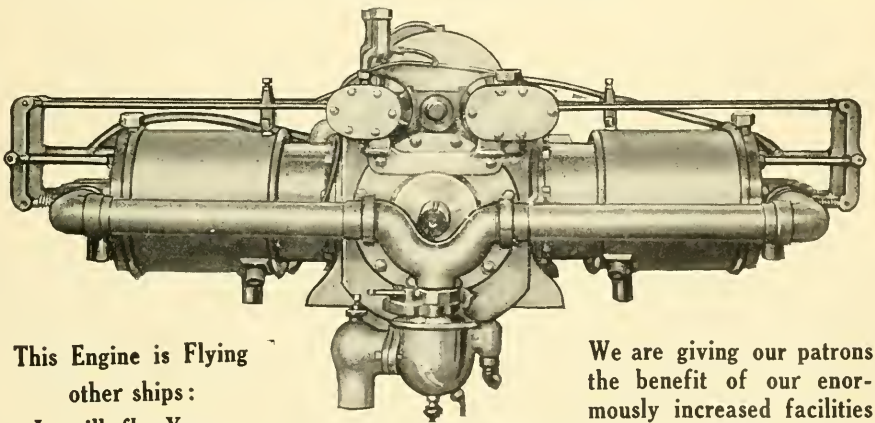
Right in Principle. Artistic in Design. Perfect in Material and Workmanship. Powerful in Action.



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FOX AERO MOTOR

THE notable achievements of Mrs. Raiche at Mineola have proven the power and endurance of Fox Aero Motors in actual flight. *The First Woman Aviator in America.*

¶ Fox Aero Motors are the simplest, most reliable and most powerful Aeronautic Motors yet produced. They are two-cycle water cooled, and are guaranteed against overheating under all conditions. They are equipped with the Fox Fourth Port Accelerator, the greatest improvement ever made for increasing the speed, power and flexibility of two-cycle motors.

¶ Remember Fox Marine Motors hold the world's endurance record for motor boats, and even our first aero motors have commanded instantaneous attention by their remarkable and consistent performances.

¶ Fox Aero Motors are made in six sizes, 24 to 150 H. P., four, six and eight cylinders. Full details and prices on application. Deliveries guaranteed.

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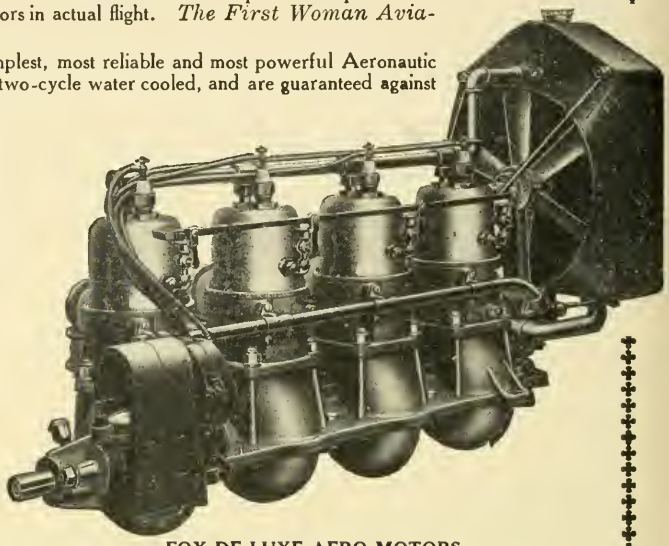
NEWPORT, Kentucky, U. S. A.



FOX DE LUXE AERO MOTORS
These Motors have radiator attached at the forward end and are without fly-wheel

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Manufacturer and Exhibitor of Biplanes and Monoplanes

MEETS ARRANGED

FLYING TAUGHT, FEE $250

School and Flying Grounds at Belmont Park

Knocked Down Frames for Curtiss and Bleriot Type Aeroplanes

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Pupils at the principal schools now must indemnify the schools by bond or insurance policy against possible accidents to third parties and the pupil must also take out an insurance policy covering his own life. Arrangements are being made so that policies may be secured at the office of AERONAUTICS. Up to the present there is no surety company in this country which will write this kind of business. It is possible that surety companies will refuse to execute bonds of this nature.

Sparling School in Illinois.

J. N. Sparling of East St. Louis, has opened a training school at Washington Park. He has three pupils enrolled, one of whom, Harry Park, of Portland, Ore., made a straightaway flight of two miles at a height of 25 ft. the fifth time out with the machine, and made circles the tenth time out. Henry Moier, of Denver, Col., another pupil, has been out a few times making short jumps. Mr. Sparling is also putting his standard machine, equipped with an Elbridge aero special or a six-cylinder Kirkham, on the market at $4500.

Five machines are being built for the school and for exhibition work.

The running gear is very good, as will be noticed from the photo. For the last three weeks the school machine has had many hard landings but the running gear saved it from any damage.

J. N. Sparling has been known in aviation for the past two years and was one of the first purchasers of aero engines just about the time the Elbridge Company started building light motors.

J. N. Sparling of East St. Louis, Ill., has a very promising pupil in Harry Park of Portland. After five lessons Park was given control of the machine and made a good straight-away flight of two miles. A day or two later he made three circuits of the two-mile track, and on another day he did a cross-country stunt of 18 miles.

A Chicago School.

Residents of Chicago can see aeroplane flights almost any day by students of the Chicago School of Aviation at Hawthorne racetrack. The school has two biplanes on the field, one a standard 28-ft. Curtiss, the other a combination of both the Curtiss and Farman type, having a wing space of 460 sq. ft. The large machine has been reinforced in the principal members, notably those of the chassis, and has been made extra heavy. The pupils are allowed to roll over the ground, "cut grass," as it is termed, in the big tutor, and when able to make short hops in it and to maintain its equilibrium, they are put into one of the real flyers and take the air in earnest.

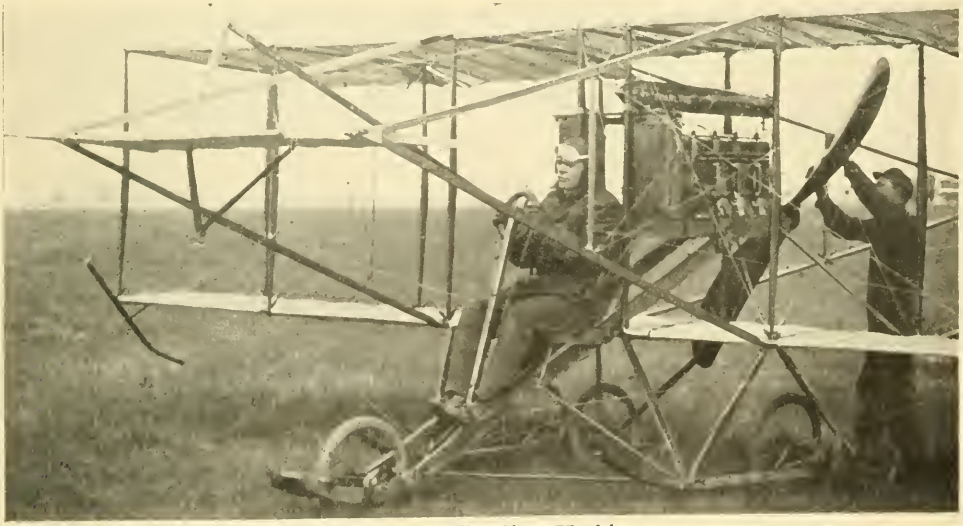
The Moisant School.

The Moisant Bleriot has been busy teaching under the piloting of Andre Houpert. Miss Harriet Quimby, a magazine writer for "Leslie's," was the first pupil, getting up at four in the morning and donning her flying trousers (it would not be nice to say "pants") for her grass-cutting work. She is writing her experiences in a series of articles in "Leslie's."

It is expected that five concrete hangars, a concrete grandstand, and concrete clubhouse will be ready by June 15 on the new Moisant grounds, near Westbury, L. I., and the new field is being prepared very rapidly for school work. A number of applications have been received for hangars, but so far no action has been taken on these applications. It has already been decided that no pupil will be allowed to graduate from the Moisant School unless he shall have spent at least four weeks under the theoretical and practical instruction of the various department heads. All the pupils receive instruction daily practically and theoretically in the operation, construction and repair of aeroplane motors as well as the construction and repair of the various parts of an aeroplane. No Moisant pupil will be allowed to try for his pilot's license until he shall have fulfilled all of the requirements of the course in the Moisant School.

The Aeronautic School of Engineers announces the following changes in prices of tuition: Construction course, $100, payable $25 in advance, $10 per week thereafter; flight course, $200 for a series of instructions in which straight-away flights are guaranteed. Motor knowledge included in both courses.

The practice of building flying models has assumed much greater proportions in England than in America. Meets and contests are conducted all over Great Britain every day. Among the large concerns which make supplies of all kinds for models is A. Melcombe, Castle Road, Bedford, England. Everything that could possibly be thought of for use in models is listed in a wealth of sizes. Wonderful little 1 and 2-cylinder engines are made, running from 1/3 to 1¾ h. p., at prices as low as $20. If desired, the parts for these can be had and "Young Enthusiast" can build his own engine. There are supplies for the models as complete as for a full-sized machine. It does not seem possible for machinery to turn out turnbuckles, screws, sockets, etc., of such small size.



Park in the Sparling Machine.

Helmut Hirth who on May 8 made a new Two-Man World Altitude Record of 800 Meters (2,-625 ft.) at Stuttgart, Germany, in an Etrich Monoplane. On May 26 he completed the 360-Mile Reliability Contest, Winning the Prize. He used a 4-cyl. Water Cooled Vertical Lohner Motor, Overhead Valves, with Bosch Equipment.

VEDRINES WINS PARIS-MADRID RACE.

THE greatest air race ever flown was won by Vedrines when he landed at Madrid, Spain, on May 26, after covering approximately 842 statute miles from Paris, from which city he started on May 22, at a speed averaging in the neighborhood of 69 miles per hour, taking cabled reports as a basis. The actual flying time is given as 12 hrs. 18 min.

After winning this, he started immediately from Paris in the Paris-Rome-Turin contest, a distance total via the planned route of 1,300 miles.

The Paris-Madrid race, organized by the journal "Le Petit Parisien," was divided into three parts; Paris to Angouleme (248 miles), Angouleme to St. Sebastian (208 miles), and from there to Madrid (386 miles).

The Pyrenees had to be crossed between St. Sebastian and Madrid, and altitudes of 4,788 ft. had to be attained.

Owing to the unfortunate accident in which M. Berteaux, the minister of war, was killed by the fall of Aviator Train's machine, several of the competitors retired from the race.

Garros (Moisant Bleriot), Gilbert (Bleriot), Le Lasseur (Bleriot) and Beaumont (Bleriot) had started before the accident, Garros being the first to arrive at Angouleme with Gilbert following. Le Lasseur landed near Cosne, having become lost in a fog. Beaumont smashed a wing at Asay-Sur-Imbro and was out of the contest. No one else started Sunday, but on Monday Vedrines (Morane) started at 4:11 o'clock and reached Angouleme at 7:50 o'clock, having made the 248 miles in 3 hrs. 39 min. This time is the more remarkable in that a stop was made at Etamps to regulate the motor.

Frey (Morane) started at 2:06 p. m., but was overturned at Etamps by a squall. He was not injured but the machine was smashed and he was out of the contest.

The Second Stage.

Garros left at 5:13 o'clock, Gibert following six minutes later. Vedrines postponed his start till 7:05 on account of the haze.

Garros arrived at St. Sebastian at 11:40, he having to stop two hours to take on oil. Gibert was lost in the fog and landed at Biarritz at 9:00 o'clock to take on oil.

Vedrines made no stops and arrived at 10:59 o'clock.

Last Stage.

All the airmen had troubles on this stage of the race. Gibert who left at 6:28 o'clock was reported to have been attacked by an eagle, which he had to shoot in order to defend himself. He landed abruptly about 40 miles from St. Sebastian, damaging his machine slightly. Vedrine, who started at 7:17, landed near Burgos about 140 miles north of Madrid. Garros started at 7:12, his motor failing forced him to descend near Usurbil. The next day Vedrines made the flight from Burgos to Madrid in 2 hrs. 45 mins., landing at the aerodrome at 8:06. He crossed the Somosierra Pass at an elevation of 6,500 ft. It is reported that he also was attacked by eagles and had trouble in avoiding them.

LIST OF AMERICAN PILOTS.

The total number of living aviators licensed by the Aero Club of America is 21.

Following is a list of their names and the number of their licenses, together with the names of the machines used at the time of issuance of license:

1 Glenn H. Curtiss (Curtiss).
2 Frank P. Lahm (Wright).
3 Louis Paulhan (Farman, now flying Paulhan).
4 Orville Wright (Wright).
5 Wilbur Wright (Wright).
6 Clifford B. Harmon (Farman).
7 Capt. Thomas S. Baldwin (Baldwin).
8 J. Armstrong Drexel (Bleriot).
9 Tod Shriver (Curtiss type).
10 Charles F. Willard (Curtiss).
11 J. C. Mars (Curtiss).
12 Charles K. Hamilton (Curtiss).
13 John B. Moisant (Bleriot).
14 Charles Weymann (Farman).
15 Arthur Stone (?).
16 Harry S. Harkness (Antoinette).
17 Eugene Ely (Curtiss).
18 J. A. D. McCurdy (Curtiss).
19 Walter R. Brookins (Wright).
20 Ralph Johnstone (Wright).
21 Arch Hoxsey (Wright).
22 J. C. Turpin (Wright).
23 A. L. Welch (Wright).
24 J. J. Frisbie (Curtiss type).
25 P. O. Parmalee (Wright).
26 Frank C. Coffyn (Wright).

Of the above, John B. Moisant, Ralph Johnstone and Arch Hoxsey are deceased.

Some of the above received their licenses from the Aero Club of America on the strength of performances observed by other clubs. Curtiss, Orville and Wilbur Wright have all foreign licenses in addition.

Other American aviators who hold foreign licenses are:

James V. Martin (Burgess Baby Farman).
St. Croix Johnstone (Bleriot).
Samuel Pierce (Bleriot).
A. J. Houpert (Bleriot).
J. A. Cummings (Bleriot).
Duval La Chapelle (French Wright).
Earle L. Ovington (Bleriot).

There are, therefore, but 28 living Americans holding aviation pilot licenses, Messrs. McCurdy and Paulhan not being citizens. There are a number of good aviators who have not bothered with any license, as there has been no need for a pilot's license as yet.

Successful Flight

At first attempt has been Invariably Achieved by all users of

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Aeroplanes Gliders—Supplies

¶ The Wittemann Biplane built for safety and reliability, equipped with double controls, strongest spring landing chassis. Construction embodies the best design, and a desirable factor of safety allowed for all material used in our machine.

¶ We carry a large stock of steel fittings, laminated ribs and struts of all sizes and designs, also all other materials which are used in standard makes of machines. Complete sets of Biplane parts knocked down and accurately fitted. Send for list. :: :: :: :: :: ::

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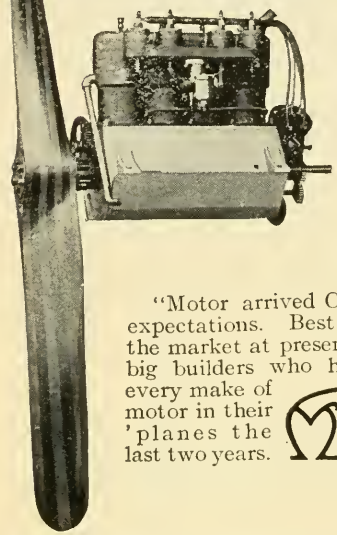

¶ The name "Aeromotor" or "Detroit Aeromotor" led to confusion of our engine with certain others in a way that did not add to its reputation. ¶ The new name is in honor of the designer. The workmanship and materials are as select as ever—the kind that has brought repeat orders from every district in which our motors were sold the last twelve months. ¶ The strong, simple, compact MAXIMOTOR appeals to the practical aviator.

What the Other Fellows Say About The MAXIMOTOR

Los Angeles, May 11, 1911.

"Motor arrived O. K. and far beyond expectations. Best aeronautical motor on the market at present."—Eaton Bros., the big builders who have used practically every make of motor in their 'planes the last two years.

Elkart, Ind., May 18, 1911.

"Made seven beautiful flights. Your engine never refused to respond promptly at the first turn and never failed to lift the machine inside of 250 feet run."—B. C. McClellan, president, McClellan Aviation Co.

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Dear Mr. Gibson:—

In my recent trip to the Orient and the Straits Settlements, I used a Gibson Propeller exclusively, without an accident or a breakage of any kind. To my mind, it is the best propeller made and the results obtained are absolutely perfect.

Very truly yours,
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DO YOU WANT to anchor your machine and help pull mother earth around with the **THRUST?**

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My dear Gibson:—

You will no doubt be interested in the results given by your special 8 foot diameter, 6 foot pitch Tractor propeller on W. L. Fairchild's machine, driven by one of our 100 H. P. engines.

At 950 r. p. m. it developed a pull of upwards of 520 lbs. This is not very definite, but as the stop on the scale does not permit it to register above 520 it cannot be stated how much more actual pull was developed. However, even at 520 lbs., I think the results very interesting.

Very truly yours,
THE EMERSON ENGINE COMPANY
J. R. Westerfield.

These are not broad statements. They are facts. When I claim success, it is so. Send for my Red Book. It tells you more.

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EXHIBITION FLYING

Naturally Banked in Turning—Willard, in Provo, Utah.

ASHEVILLE, N. C., April 17-18. Beachey flew.

BOISE, IDAHO, April 19-21.—Charles F. Willard and Walter Brookins, of the Wright Company. Good crowds and lots of nice flying. The feature of the meet was passenger carrying by Brookins, who took as passenger the Lieutenant-Governor of the State of Idaho and was given a commission as Lieutenant-Colonel on the Governor's staff at Boise.

IDAHO FALLS, Idaho, April 23. Charles F. Willard flew one afternoon. One of the most remarkable things about the place was that out of a town of about 5,000 people there were 9,000 at the meet.

DENVER, Colo., April 21-23. The exhibition given here by the Moisant International Aviators was spoiled by the high winds prevalent. On one day even Rene Simon refused to fly, and a large crowd went home disappointed.

NEWTON, Kan., April 26-27. Moisant Aviators. Barrier went to more than 6,000 ft. Seymour broke his machine.

WALLA WALLA, Wash., April 27-29. Walter Brookins and Charles F. Willard did the flying. The feature of the meet was a complimentary flight by both men to the penitentiary for the benefit of the inmates. Of 1,000 men there, 43 were men having a life sentence. This was the only opportunity they would have of ever seeing a flight. The warden allowed the men to go out in the stockade at 3.30 in the afternoon, and Mrs. Willard and Mr. Young and the warden sat on the wall and "told them what they were out for." Willard and Brookins flew about 15 minutes, over and around the institution. Willard went up about 1,000 feet, and did a spiral around the penitentiary. The men applauded and were most enthusiastic.

NASHVILLE, Tenn., April 27-29. Ward, Beachy and McCurdy flew.

ST. JOSEPH, Mo., May 1-7. Moisant Aviators flew.

WICHITA, Kan., May 4-7. Curtiss aviators Ely, Ward and C. C. Wittmer. Ely did spectacular flying in a heavy wind.

WASHINGTON, D. C., May 4-7. McCurdy, Beachey and Robinson, all Curtiss aviators. Here Beachey obtained his pilot license.

Beachey added to his record of being the first man to fly around the dome of the National Capitol in a dirigible balloon by taking his Curtiss racer out and flying from the Bennings race track across the city, circling the capitol dome twice and returning to the track in one of the prettiest flights that has ever been made in Washington and made Beachey quite a popular hero. The meet was very poorly attended.

BRIDGEPORT, Conn., May 6-7. Earle L. Ovington flew his new 70 h.p. Bleriot in an exhibition from Steeplechase Island in Bridgeport harbor. Some beautiful flights were made. In one he dropped suddenly a great distance as he was caught in a "hole" and caused spectators to gaze in dread, but he skilfully kept the machine in balance and landed safely.

OMAHA, Nebr., May 8-10. Moisant International Aviators. The attendance was poor and there was plenty of wind. Simon did about all the flying. Charles Boyersdorfer joined the Moisant flyers here with his Curtiss-type and a Gnome engine was out in it.

HOT SPRINGS, Ark., May 10-11. Jimmie Ward flew. Bad wind on first day. Good attendance second day.

FORT SMITH, Ark., May 12-13. Ward and Wittmer flew. Good attendance. Ward flew over the city on both days.

Beachey is Reckless Flier.

BRIDGEPORT, Ct., May 11-14.—J. A. D. McCurdy and Lincoln Beachey opened the new Connecticut flying park of Christopher J. Lake, called "Bridgeport Aerodrome," with fine flying. Beachey, owing to his sensational and, perhaps, reckless flying, caught the fancy of the crowds. His flight from the grounds over the center of the city and around the big new Hotel Stratfield was the sensation. A local newspaper conducted a contest and a young man and woman, winners, were each given a flight of about five miles out over Long Island Sound and back.

Mr. Lake has an exceptional flying field and it will, no doubt, become Connecticut's aviation center, particularly as Bridgeport is the home of the Aero Club of Connecticut.

Beachey's flying is most sensational. He shoots down at fast speed toward a scampering crowd, then slants up at a 45-degree angle and straightens out. Some day he may not level in time and then ——

Beachey flew from Bridgeport to New Haven, landing on Yale Field at close of meet.

KANSAS CITY, May 12-14.—Willard and Ely flew. Perkins flew his kites. Not enough people to "wad a gun."

ATLANTIC, Ia., May 15-16.—Moisant aviators gave exhibition.

PADUCAH, May 18-19. -H. A. Robinson, Curtiss flier, flew under the auspices of the "News-Democrat." Heavy wind demolished the fence on the 19th, but Robinson filled the contract.

DALLAS, Tex., May 17-20.—It was very windy the first two days of the meet, but notwithstanding this Ely and Ward made several flights. The weather was much better the last two days and Ely, Ward and Wittmer all flew.

Sopwith Flies in America.

PHILA., Pa., May 17-20.—Thomas Sopwith, the English aviator now visiting this country, had several days of flying in Philadelphia recently. With automobile races as a counter attraction, Sopwith gave exhibition flights at the Point Breeze race track. Previous to the advertised dates Sopwith made a number of practice flights with his Howard Wright biplane, and on the 15th crashed into a fence, smashing the right wing of the machine. The day before this he had collided with a fence, but without damage to the biplane. The machine was quickly patched up, in time for the exhibition flights.

Sopwith announced that he had sent to England for the Martin-Handasyde monoplane, which he purchased before leaving his own country, and which was exhibited at the recent aero show at Olympia.

The Baron de Forest $20,000 prize for the longest flight across the English channel made by an Englishman in an all-British machine was won by Sopwith, who arrived in America the first part of May with the intention of giving exhibitions. In trying to use a new Bleriot 70 at Mineola on May 13th, after a flight of 35 minutes he had a bad smash, injuring the engine as well as breaking up the machine. The machine was shipped back to the Bleriot factory. He had taken up two mechanics one after the other and then took up Philip W. Wilcox for a passenger flight at an altitude of about 100 feet and on a turn was caught by a gust of wind which threw the machine over at an angle of more than 45 degrees. By clever manipulation he was able to get it practically righted but in doing so he used all of his elevation and one of the wheels struck the ground, the machine hitting on its nose and throwing the men out.

Sopwith Flies over Philadelphia.

On May 17 Sopwith flew over the center of Philadelphia, circling the high tower of the City Hall. He left the Point Breeze track without announcing his intention and as he disappeared there was much speculation as to what had happened to him. After being gone about 17 minutes he was seen returning and landed safely at the field. The over-city flight created great excitement in town and the drug stores did a rushing business in liniments supposed to be good for stiff necks.

NEW HAVEN, Ct., May 19-20.—Another successful show was given by the Yale Aero Club, in which McCurdy and Beachey took part. Beachey flew over from Bridgeport the last day of the exhibition there, a distance of 15 miles in 15 minutes.

SIOUX CITY, Iowa, May 19-23.—In a 20-minute aerial spin on the first day Rene Simon, the little French aviator whose recklessness has caused him to be called "The Fool Flyer," opened the meet, crossed two rivers and three states. Leaving the Tri-State fair grounds, Simon made one big circle 14 miles in circumference and following it by one more circle just a little smaller, completed his unique flight. A gale had the day before shattered hopes of opening the meet on schedule time.

Within a few miles of the field the corners of three states were divided by the Missouri and the Sioux rivers. At 5 o'clock Simon went aloft and followed the course that had already been mapped out. The wind was still blowing a gale and the plucky birdman was buffeted about in an astonishing manner. He found that his machine did not respond to his rudder as quickly as it should. When he landed mechanicians discovered a long slit in the rubberized silk covering, which, becoming inflated, was more unwieldy than usual.

Wiseman Starts Exhibitions

Fred J. Wiseman, one of San Francisco's first flyers, has started show flying in real earnest. Wiseman used one of the first Hall-Scott engines put out and complete details were given in the September 1910 number.

SNOHOMISH and EVERETT, Wash., May 4—Fred J. Wiseman flew an exhibition in his "Curtiss-Farman-Wright" biplane.

NO. YAKIMA, Wash., May 13-14.—Fred J. Wiseman at State Fair grounds. Flew over city.

ELLENSBURG, May 16.—Wiseman flew exhibition date here and at Olympia, May, 18. Route from here covers Tacoma, Seattle, Vancouver and Victoria.

LINCOLN, Neb., May 24-26.—H. A. Robinson and J. J. Ward, Curtiss flyers, filled three days' engagement here; going thence to Joplin, Mo., for three days.

U. S. CALENDAR.

May 24-26—Lincoln, Neb., Curtiss exhibition.
May 27-30—Boston, glider contests of Harvard A. C.
May 28-30—Fort Wayne, Ind., Curtiss exhibition.
May 28-30—Joplin, Mo., Curtiss exhibition.
May 29-31—Saginaw, Mich., Wright exhibition.
May 29-31—Hartford, Conn., Wright exhibition.
May 29-June 3—Wilkesbarre, Pa. Curtiss exhibition.
May 29-June 3—Columbus, O., Wright exhibition.
June 1-3—Little Rock, Ark., Curtiss exhibition.
June 2—Philippi, W. Va., Curtiss exhibition.
June 3—North Adams, Mass., Intercollegiate balloon race.
June 7—Fort Erie Beach, Buffalo, N. Y. Walter Johnson in Thomas biplane.
June 7-10—Wilmington, Del., Wright exhibition.
June 9-10—Evansville, Ind., Curtiss exhibition.
June 9-10—Springfield, Mass., Curtiss exhibition.
June 9-10—Joliet, Ill., Wright exhibition.
June 13—Lafayette, Ind., Curtiss exhibition.
June 13-14—Peoria, Ill., Wright exhibition.
June 15-17—Dayton, O., Wright exhibition.
June 16-17—Quincy, Ill., Wright exhibition.
June 20-23—Buffalo, N. Y. Curtiss exhibition.
June 29-July 4—Detroit, Moisant aviators.
July 1—Gordon Bennett aviation race, England.
July 10—Gordon Bennett balloon elimination, Kansas City.
July 20-22—Saratoga Springs, N. Y., Wright exhibition.
August 2-4—Colorado Springs, Col., Wright exhibition.
August 12-20—Grant Park, Chicago, International Meet.
August 26-September 4—Boston, meet of Harvard A. S.
September 29-October 7—Springfield, Ill., Wright exhibition.
October 5—Gordon Bennett balloon race, Kansas City.
January 10-20, 1912—Los Angeles, aviation and arrangements not certain.

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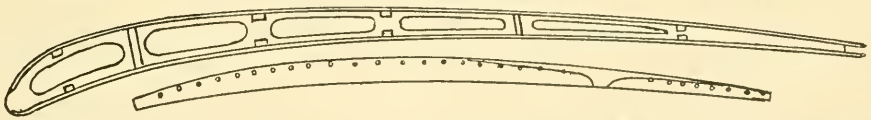

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¶ Pneumatic tires are often credited with possessing elasticity which frequently is really the property of the air, and not of the tire that contains it. Pneumatic tires for aeroplanes, as commonly made, contain two or more plies of canvas, which is obviously *not elastic*. Even though elastic rubber forms the outer and inner layers of such tires, the canvas tube which actually holds the air remains unyielding and inelastic.

¶ To produce a tire elastic *per se*, and thus capable of supplementing the elasticity of the air, the logical course would be to eliminate the canvas, leaving an all-rubber tire like an automobile inner tube. Unfortunately, a tire of this construction would be unpractical, because it would not be strong enough.

¶ The Palmer aeroplane tire is *the nearest approach to the all-rubber tire* that is possible without sacrificing strength. Instead of canvas, strong linen threads, parallel and continuous, are imbedded in strips of pure rubber, which are wound spirally around the rubber inner tube. The threads in each layer (there are four of them) run at a right angle to those in the next. An outer cover of tough rubber completes the tire.

¶ Under pressure the walls of the Palmer aeroplane tire *expand*. The ordinary tire will rebound sharply from an obstacle, but the Palmer passes smoothly over, absorbing the shock through its unique *rubber-plus-air* elasticity. Thus the exceedingly important function of protecting from shock the painstakingly and expensively assembled frame-work of the aeroplane is incomparably better performed by Palmer aeroplane tires than by any other kind.

¶ Palmer tires are *light but amply strong*. They are made in any size, with or without lugs to bolt through the rims. They may be had with a puncture-preventing tread strip of imported chrome leather. In this form, Palmer tires are more than ever *the final word in aeroplane tire construction*.

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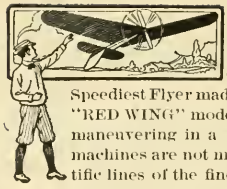

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Photo by E. C. Brown

New Harvard Glider, Wright Type, with Warping Wings, of R. M. Allen, and Launching Tower for Meet.

HARVARD GLIDER MEET.

Eleven college aero club entries have been received for Harvard's Intercollegiate Glider Meet, at Atlantic, Mass., May 27-30.

The events will be classified for body and mechanical control machines, and cups offered in each division. An admission of 50 cents will be charged to the field, which will admit to the best seats. No reserved seats. The gliding will probably mainly be done late in the afternoon when the winds are the lightest.

There are on the field now three machines of the Burgess Co., of Marblehead, one of which is Chas. K. Hamilton's. It is very probable that exhibition flights will be made during the days of the meet in these Burgess-made Wright 'planes. The Harvard Aeronautical Society is going to try to get its Roe triplane in shape and make flights with that machine also. Its new Wright-type glider is being practiced with, and the slope given a testing out in preparation for the meet. There are two large permanent hangars and one large tent, and another tent is to be erected soon for storage of the visiting gliders.

George A. Richardson, president of the Intercollegiate Aeronautical Association, is to attend the meet and fly the U. of Penn. machine. He will give an illustrated lecture on the evening of May 31, which ought to add to the interest in college aeronautics at this time.

The entries to date are: Dartmouth, Cornell, Tufts, U. of Penn., M. I. T., Williams, Worcester Polytechnic Institute, Swarthmore, Haverford, Waltham Aeronautical Society and Harvard. The meet will be conducted under the management of the Society, with the co-operation of the Intercollegiate Aero Association.

BIG CHICAGO MEET.

The Aero Club of Illinois has worked hard in organizing a big meet schedules for August 12-20, at Grant Park . A large committee, with James E. Plew, president of the club, as chairman, has been working for a guarantee fund of $100,000, which has practically all been subscribed. Committees have been appointed and work has now actually commenced. This is expected to be the biggest event of the season. Grant Park is in the heart of the City of Chicago, and is so located that water events can be run as well as flights from the land. This city park has been made available by the Park Commissioners of Chicago. If any profit should accrue, it will be given to the charities of Chicago.

COLLEGES HOLD BALLOON RACE.

Five balloons are scheduled to take part in the first intercollegiate balloon race ever held, starting from North Adams, Mass., on June 3d. The contest is open to any aero club or college aero club, and the pilot of the competing balloons need not be a member of the competing club. The balloons are handicapped: a 35,000 cubic foot balloon, to carry 2 passengers; a 56,000 cubic foot balloon, to carry 3 passengers, and balloons of larger size are to be filled according to the ruling of the referee, A. Leo Stevens.

The race is being conducted under the auspices of the Williams Aeronautical Society. Two cups have been offered, one for distance and one for direction, by Clifford Black and Howard Scholle, both Williams men. Dartmouth, Williams and Massachusetts Institute of Technology are all entered. W. P. Shearman, of Williams, will pilot the "Stevens 27." Other balloons that are certain to be in the race are the "North Adams No. 1," the "Boston" and the "Pennsylvania."

BENNETT AVIATION RACE.

The Bennett International Aviation Race, which is flown over the Royal Aero Club's grounds at Eastchurch, England, on July 1, will not be a walkover for the American team, so far as the situation at present phrophesies. Only one American has been chosen thus far, Henry Weymann, who, some time ago, took up the Nieuport monoplane. Other names have been considered, James V. Martin, who flies the Burgess-built "Baby Farman" of "Grimy White"; Earle L. Ovington (Bleriot 70 gnome), and Arthur Stone, who has been flying the new "Queen" monoplane (Bleriot type) at Belmont. Weymann stands the best chance of any of these, as the Nieuport machine has recently made new records.

GORDON BENNETT BALLOON RACE.

For the international race at Kansas City, October 5, there will probably be 9 balloons, 3 each from France, Germany and America. The American team will include Alan R. Hawley, 1910 winner, and the other two will be those who get first and second in the National, which is an elimination contest. Germany has just held its elimination.

If America wins the race this fall, the third time in succession, the cup will become the property of the club, and further competition for this cup will cease.

NATIONAL BALLOON RACE.

The only cities thus far received for this race, which takes place July 10 at Kansas City, are, "Topeka II.," of the Western Aero Association; the balloon of Wm. Assmann of St. Louis, and the "Kansas."

All pilots competing in the above two events are also very fortunate. A personal inspection made by H. E. Honeywell, showed a large and well-situated grounds, plenty of good gas at hand, and 283 miles greater distance from the ocean, permitting all records to be broken. It is very probable that there will be a new world's record established this year.

President Geo. M. Myers and his able staff have the work well advanced, even to the minutest detail.

Provisions are made to inflate twelve or more large racing balloons in six to eight hours. Grand stands to seat thirty thousand people also a large automobile court and ample police protection.

The Kansas City Aero Club have placed their order with the French-American Balloon Co. for a fine new 80,000 cu. ft. racing balloon; also made Honeywell, who will pilot same, pledge to throw away his clothes if necessary, to win.

The Aero Club of St. Louis will enter three or four balloons, with a large delegation.

The Kansas City Aero Club will offer a silver cup for the winner of the national race, which starts from Kansas City July 10. A silver cup will also be given to the balloon securing second place in the national race. In addition to these trophies, the club will give a bonus of one hundred dollars to each balloon which actually starts in the race. The program for the national race, July 10, will provide that the first balloon shall start at four o'clock p. m., and that the others shall follow at five minute intervals.

The grounds chosen are situated within three blocks of the gas works, and the United Gas Improvement Company guarantees an abundant supply of gas of a specific gravity of at least .40. The fact that the gas has such a short distance to travel and the fact that the piping is all being arranged especially with a view to giving every balloon an equal chance to secure the best quality of gas, seems to assure the contestants will not have any complaint on the score of gas.

New Flying Grounds.

The **Aero Club of New York,** located at Nassau Boulevard, on the Long Island Railroad, the property of the Garden City Estates Co., of which the Hon. Timothy L. Woodruff is president, has applied for a charter from the State. The old "New York Aero Club," which expected last year to use these grounds, has been dissolved. The president is the Hon. Timothy L. Woodruff; vice-president, Clifford B. Harmon; second vice-president, Hudson Maxim; 3d vice-president, Capt. Thos. S. Baldwin, 4th V.P., and R. R. Sinclair, secretary. The directors are: Hon. Timothy L. Woodruff, Clifford B. Harmon, Hudson Maxim, William H. English, R. R. Sinclair, Colgate Hoyt, Edward M. Grout and Earle L. Ovington. A tract of land about 2½ miles in length by ¾ of a mile in width, near the Garden City station, is being used for grounds, and already ten sheds have been erected. Another ten sheds are expected to be built in the near future. Those who have already taken sheds are Earle L. Ovington, Capt. Thos. S. Baldwin, Harry S. Harkness, Clifford B. Harmon, George Russell, Romain Berger, Queens Aeroplane Company, Ladis Lewkowicz, L. P. Sanger, Jr., and Fred P. Schneider. The privileges of the Garden City Estates Club have been extended to the members of the Aero Club of New York. Membership dues are $10 a year; no initiation fee. The grounds can be reached by the Long Island Railroad from the Flatbush Avenue Station, Brooklyn, or the new Pennsylvania Station, New York.

The Aero Club of Long Island will begin flights in a few weeks by members of the club. Heretofore the club confined its energies mostly to instruction of its members and the building up of a permanent organization.

Francis Willson, member, is assembling his Curtiss-type biplane at Mineola. It will be driven by a 50 h. p. Kirkham motor. It possesses features never before embodied in a flying machine, and is expected to open the eyes of some of the veterans of the old field. It is built on thoroughly sound principles and has already won the admiration of Chas. K. Hamilton.

A Chanute-type glider of exceptional efficiency has been built, after his own modifications, by Thomas Kramer, member, age 18, and has already made about 150 flights on the hills near Long Beach. Young Kramer has become expert in gliding, and is willing to match his machine and skill with any amateur. This is his fifth glider, and he has made nearly 1,000 glides.

The motorless biplane of William and Henry Newell, members, is complete, and will be shipped to Mineola and set up in preparation for towed flight prior to the installation of its motor. It is of the headless type, simple in construction, and equipped with the Newell method of control.

Charles D. Spence, member, is having constructed by the White Aeroplane Company a 40-foot monoplane embodying the most advanced and practical methods of trussing and control yet attained in that type of flying machine. In a lengthy illustrated lecture to the Aero Club of Long Island, Mr. Spence compared by actual tests the present methods with his own. The simplicity and positiveness of his construction supersede all other systems. The design of the machine's control is the most natural that can be attained, and still uses only hands and feet to operate; no shoulder guides. The building of the machine is well under way. Mr. Spence's invention is a substantial modification of the well-known Pratt truss.

The Aero Club of Long Island is an educative society, and invites inquiries from those who wish to associate with it. Address Secretary, Aero Club of Long Island, Richmond Hill, L. I.

Rhode Island Aerodrome.

The **Rhode Island Aeronautical Society,** of Providence, R. I., has secured an aviation field near Narragansett Park, which is very favorable for flights. It is flat, protected to some extent, has a straightaway of nearly a mile and is convenient to the city. Otto Hermann and Sidney Borman, both members of the society, are engaged in actual work on machines. Mr. Borman is building his fourth machine, the mechanical details of which are as near perfect as could be wished. Regular meetings are held the third Wednesday of each month, and the society is planning an active season.

The **Aero Club of Illinois** has held its annual election, and the following officers have been chosen: President, James E. Plew; first vice-president, Harold F. McCormick; second vice-president, T. Edward Wilder; secretary, Grover F. Sexton; treasurer, Charles F. Bartley; consulting engineer, James S. Stephens.

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CHARLES K. HAMILTON

Mr. Hamilton recently gave up a pre-arranged trip to buy an aeroplane abroad when an opportunity occurred for him to purchase a Burgess-Wright Biplane. He declares the Burgess-Wright to be superior to any other American or Foreign Aeroplane. He hopes to fly Burgess Aeroplanes exclusively during the coming season.

CLIFFORD B. HARMON

Mr. Harmon, at the Belmont Park International Meet, used a Farman biplane body rebuilt and improved by Burgess Company and Curtis. He has recently called on the company for plans for the latest type biplane fitted with hydroplane body.

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The War Department has ordered a Burgess Biplane for delivery in July, 1911.

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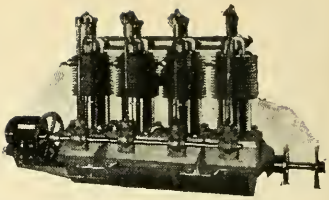

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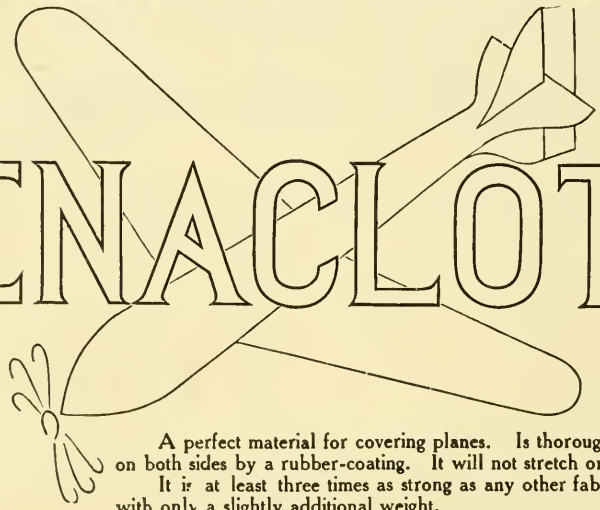

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INDEX FOR VOLUME VIII.

Note.—Volume I. started with the first issue, that of July, 1907. Volume II. started with the issue of January, 1908. Volume III. started with the July, 1908, issue. Volume IV. started with the January, 1909, number, and Volume V. with the July, 1909, number. Volume VI. started with the January, 1910, issue, and Volume VII. started with the July, 1910, number. Volume VIII. started with the January, 1911, number.

January, 1911.

	Page
Notes on the Aeroplane Propeller. By Matthew B. Sellers	1
The Life and Work of Octave Chanute	3
The Fallacy of the Screw Propeller. By C. Wesley Hewell, Jr.	5
Farman's Flight of 8 hrs., 12 min.	7
Legagneux Makes Altitude of 10,496 ft.	7
Experiments with Aeroplane Wireless. By Harry M. Horton	8
Measuring Propeller Thrust	9
English 24-hour Non-stop Aero Engine Run	11
Aeronautics and War. By Lieut.-Col. W. A. Glassford	12
Wright's Improved Anemometer. By John W. Mitchell	15
Scale Drawings of the Bleriot XI Monoplane	16
Winter Ballooning New Sport	18
Rexford Smith Machine	21
Walden-Dyott Monoplane	22
A. M. Williams' Monoplane	24
National Council Convention	26
Extension of Dewey Decimal System to Cover Aeronautics. By L. P. Brode	27
Wright Company Suits	28
Club Mews	30
Bissell Motor	31
Military Aeronautics in America for 1911.	34
Simms Motor Starter	36
Index to Volume VII	37

February, 1911.

How to Build a Curtiss-type Biplane. By G. H. Godley	41
The New York Aero Show	47
The Los Angeles Meet. By Prof. H. LaV. Twining	53
Long Model Flight Wins Stevens Cup	56
The Thompson-Van Arsdale Machine	57
60-mile Flight by Masson	59
Deaths of Hoxsey and Moisant	61
Death of Cecil Grace	62
The Physiology of High Flying	63
Scale Drawings of the 1910 Light Farman	64
Congress $125,000 Aero Appropriation	66
Wright Training School Starts	66
Many New Records Abroad	69
How Altitude Records Are Made	71
Tracy Dynamometer	75
Ascensions	77
Ryan Wants A. C. A. Made National	78
Club News	79

March, 1911.

The Dunne Automatic Stability System. By T. O'B. Hubbard	81
Insurance for Aviators	83
The New Southard Monoplane	84
National Council and Aero Club	84
Scale Drawings of Southard II. Monoplane	85
Success of the Curtiss Hydroplane. By Prof. H. LaV. Twining	86
State Registration of Aeroplanes	87
New Model Curtiss Biplane	88
Construction Aids XVII	89
McCurdy Makes Over-Sea Flight	90
American Distance Flights Cross Country.	90
Winter Flying at Mineola	93
San Francisco Meet. By Cleve T. Shaffer.	95
San Diego Meet. By H. LaV. Twining	98
Havana Meet	98
Aeroplane Reconnaisance	99
How to Build a Curtiss-type Biplane. By G. H. Godley	100
Curtiss Plant Sold	104
Aero Motors in America (Kirkham; Detroit Aero; Rinek)	106
Club News	110

April, 1911.

	Page
A Transcontinental Aero Way. By Morris Wm. Ehrlich	115
The Hydro-Aeroplane. By W. R. Turnbull, M.E.	117
What Our Aeroplane Builders Need	119
Parmelee and Foulois Make Great Record	121
Flight Progress About the Coutnry	123
Four American Rotary Motors	126
Boston's Second Aero Show	132
The Hubbard Monoplane (Scale Drawing).	136
Bleriot Bus	138
Washington Aeroplane Show. By W. Wilson Southard and Antony Jannus	139
Ascensions	141
Club News	144
The Missouri Signal Corps in Aeronautics. By Andrew Drew	145
How to Build a Curtiss-type Biplane. By G. H. Godley	146
Vaniman Propelling Mechanism Patent	149

May, 1911.

Some Facts About Soaring Flight. By E. F. Andrews	155
The Influence of Multi-Point Ignition on the Efficiency and Output of Internal Combustion Engines. By Otto Heins	156
Army to Have 30 Aviators	158
Closed Circle Aeroplane Records. By Geo. H. Scragg	160
Aeronautical Manufacturers' Association.	162
National Council and Aero Club of America	163
How to Measure the Pitch at Any Point of an Existing Propeller. By Hugo C. Gibson	164
New Fraud Medium	165
How to Build a Curtiss-type Biplane. By G. H. Godley (Serial No. 4)	166
Jannus Takes Passengers	168
Gary Machine	173
New Kimball Biplane	172
The Burgess-Wiseman Machine	173
The Meyerhoffer Triplane. By Cleve T. Shaffer	175
Sheaf and DeBerri Biplane	176
Fortney Monoplane	176
Johnson Monoplane	177
Brewer Bros. Biplane	177
Wheeler Monoplane	177
Prier Flies from London to Paris	180
A. C. A. Banquet	184
Gray Eagle Motor	186
Wolverine Two-Cylinder Motor	187
Short Bros. Landing Gear Patent	190

June, 1911.

	Page
Aerial Motors of To-day. By George S. Bradt	195
How Fast and How High May an Aeroplane Go. By Harry E. Day	197
Wireless Experiment of "N. Y. World."	199
State Aero Legislation	200
U. S. Military Aeronautics	202
Ascensions	202
Ascensions	203
Auto Club $1,000 Motor Prize	203
Baldwin Biplane III (With scale drawings)	204
Fairchild Monoplane II (With scale drawings	206
Aeronautical Society Banquet	209
Aero Club and National Council (Repudiation Agreement)	211
Howard Wright Biplane (With scale drawings)	211
Death Lt. Kelly, Hartle, Bournique and others	213
Bray and Hermann Biplanes	215
Schools of Flying in America	220
List American Pilots	212 and 222
Vedrines Wins Paris-Madrid Race	222
Club News	226
Patents	232

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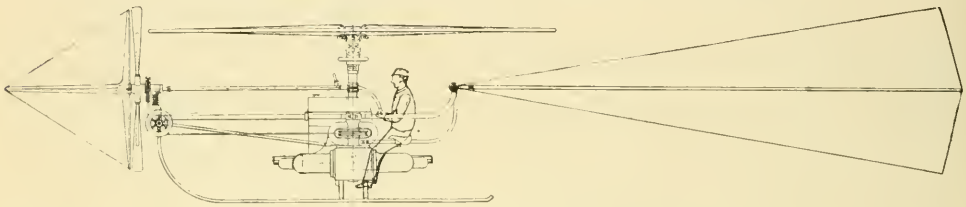

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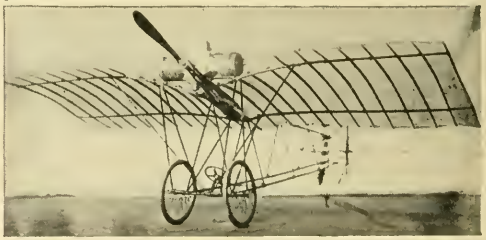

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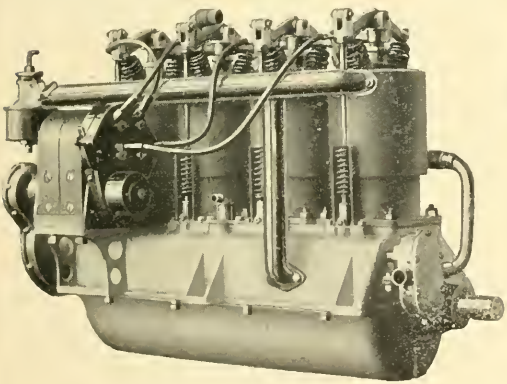
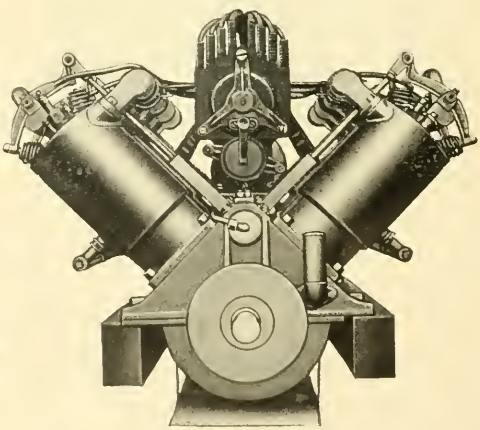
Curtiss Motors for Early Deliveries.

The Curtiss Motor Co., of Hammondsport, N. Y., are now in a position to make deliveries on two sizes of their well-known motors.

The four-cylinder motor develops 25 h. p. at 1,300 R. P. M. The cylinders are 3¾ inches by 4 inches, of cast iron, with homogeneously welded copper jackets. The valves are both in the head and are actuated by a single push rod and cam. Lubrication is by a forced feed system, the rotary oil pump which is submerged in the reservoir is operated from the main shaft. The oil is fed through the hollow cam shaft to the main bearings, thence through the hollow shaft to the crank and connecting rod bearings, the overflow returning to the reservoir. The crank case is of a special aluminum alloy, and the crank shaft is of Krupp chrome nickel steel. The weight, including oil and water pumps and magneto, is 100 pounds. Ignition is regulated by Bosch high tension magneto, driven by enclosed gears. All the bearings are of very liberal dimensions, ensuring long life. The price, including radiator, magneto and Curtiss propeller, is $1,600.



Curtiss 4-Cylinder Motor.



The Curtiss Eight.

The eight-cylinder motor develops in excess of 50 h. p. at 1,200 R. P. M. The cylinders, 4-inch bore and stroke, are cast separately and are fitted with light steel water-jackets. The general specifications are the same as the four-cylinder. The weight, including oil and water pumps and magneto, is 200 pounds. The price of the 50 h. p. power plant, including fuel tank, radiator, propeller and all accessories, is $3,000.

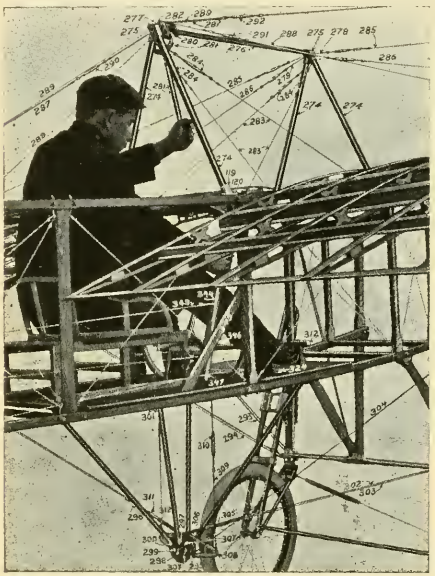
Brooks K. D. Aeroplanes.

The Brooks Aeroplane Co., of Saginaw, Mich., reports the recent sale of several monoplanes.

The original intention to manufacture monoplanes only by the well-known Brooks knockdown system for boats, has been modified to the extent that they are now prepared to also market biplanes, and in addition to furnishing the assembled sections in the knockdown, are also able to furnish the complete machines either ready for the installation of the power plant or equipped with 30 to 50 h. p. motors ready for flight if desired.

Every effort has been made to combine in a standard design, strength, quality of material, perfect workmanship and construction, with simplicity and safety of control, the aim being to place on the market a machine in which the factor of safety predominated.

The monoplane built by this company is of the well-known Bleriot type, embodying all the 1911 improvements, while the biplane is of the Farman type.



Shows Parts Numbered for Assembling.

There are two complete and separate systems of control, so arranged that the failure of one set of control would not make the machine inoperative. The emergency guys are fitted in such a way as to normally carry none of the load, so that if a fracture occurred, the emergency guy would immediately assume the strain.

After repeated experiments it has been decided to abandon the regular Bleriot "U" type of wire strainer, which was originally used in the Brooks monoplane, and in place thereof pressed steel fastenings have been substituted, eliminating entirely the boring of holes in the longitudinal body members, which necessarily weakened the members in question. This new fastening was adopted after repeated experiments and tests on full-sized machines, showing that the point of fracture of the body when strained to the breaking point was invariable where the "U" bolts went through the longitudinal members.

An important feature in connection with the manufacture of aeroplanes by this system is the fact that all parts of the machines manufactured by this company are made to remplate on special jigs, so that replacement and duplication of parts can be simply, accurately and immediately made.

Chicago Company Increases Space.

The Chicago Aeroplane Manufacturing Co. of Chicago, Ill., announces an increase in its capital stock to $50,000. Progress with this company has been rapid. Less than two months ago the company found it necessary to more than treble its floor space, and now occupies quarters with seven stores on Cottage Grove Ave., No. 2224 to No. 2238, and three stores on Indiana Ave., the building extending through from one street to the other.

In addition to this, the company has for an aviation field the Hawthorne racetrack.

The present equipment provides for the completion of two aeroplanes per week. In spite of these increased facilities, the company finds itself unable to meet the demand for its product, and negotiations have already been closed for three more stores on Indiana Ave., which are being remodeled to be used as machine shops, and the directors of the company have decided to increase their capital stock to $50,000.

D. L. Dennis of Franklin, Ind., visited the motor factory of R. O. Rubel, Jr., & Co., and after several demonstrations of the "Gray Eagle" motor, he purchased one for his biplane, which he expects to have ready for making exhibition flights within the next 30 days.

Another "Gray Eagle" motor was sold to Mr. Louis Fernsner of Trenton, N. J., for his Bleriot style monoplane.

D. A. Kreamer of Freeport, Ill., has made a number of flights recently with his Curtiss type, using a four-cylinder, 30-35-horsepower Boulevard motor. The Chicago School of Aviation has also made a test of the motor.

Simplicity is the feature of the Boulevard motor. It has the overhead cam shaft, doing away with rocker arms, push rods, etc. Having the valves in the head, it is a simple matter to remove them, substitute new ones and regrind the old ones at leisure moments. The Hekla 1½-in. steel crankshaft is another important point. The six-cylinder, 50-horsepower has a 1⅞-in. shaft, and there are 2-in. crankshafts in the four-cylinder, 60-horsepower, and the eight-cylinder, 80-horsepower. The system of driving the magneto direct on the crankshaft is unique and dispenses with gears, which is a great advantage. The Boulevard Engine Co. has moved into new quarters and guarantees prompt deliveries. The office is at Ohio Building, St. Louis, Mo.

Gibson propellers are now standard equipment with the Aeronautic School of Engineers, the Moisant School and Queen Aeroplane Co.

The new Adams-Farwell motor, made by the Adams Co., Dubuque, Ia., announcement of experiments with which has previously been made in AERONAUTICS, will shortly be ready for the market. The cylinders revolve and the crankshaft is stationary. The cylinders are 6 in. by 6 in., A. L. A. M. rating, 72 horsepower, five cylinders, four cycle, radial, mechanical intake valve, 80 pounds compression, bronze bearings. A six-cylinder motor, in which both cylinders and crank revolve in opposite directions, is being proven. This is intended to drive propellers in opposite directions.

Although one may know in a general way that there is a great deal of activity in the building of machines and accessories, it is hard to realize the extent to which the industry has been carried in so short a time, unless one looks at the catalogues of some of the various makers.

The Chicago Aero Works, 164 North Wabash Ave., Chicago, has put out a catalogue which shows this progress to a striking degree. The main feature of the catalogue is the listing of all the parts of a Curtiss type machine, with the prices of each part. This will enable the novice to obtain any or all of the parts of this machine and assemble it himself. A great variety of struts, ribs and beams are also listed, as well as hardware for both full-sized machines and models. A Curtiss copy, engined, ready for flight, is sold at $2,000.

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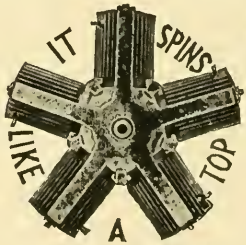

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Maximotor Makers Detroit.

The Detroit Aeronautic Construction Co, Detroit, Mich., has changed its name to "Maximotor Makers, Detroit," at 1913 Jefferson avenue. The motor will now be called "Maximotor" instead of "Aeromotor."

Maximilian Dingfelder, president and designer of Maximotor Makers, who helped construct the famous Daimler engine used in the German Mercedes, has been building marine engines for ten years, the last five of which his boats held the Detroit championship against the speediest racers brought against them from all over the country. He drove the first automobile on the streets of Detroit long before Henry Ford started the industry which nearly doubled the city's population in five years. For the past three years Mr. Dingfelder has been experimenting with aeronautic engines, and attending the big meets and exhibitions. The "Aeromotor" was put on the market by his company, the Detroit Aeronautic Construction Co., about a year ago. It is now flying in 'planes and dirigibles as far away as Japan.

John T. Patterson, secretary, business manager of the firm, was formerly in the publicity business with the Sacramento (Cal.) Chamber of Commerce, and was recently engaged in automobile advertising at Detroit.

The factory is still at the foot of Crane avenue, and the propeller branch shop on Atwater street, but the offices have been moved up to 1913 Jefferson avenue, E.

Hints on Engine Installation.

The new Elbridge engine catalog contains some good pointers for the novice, in addition to describing the features of that well-known motor.

Don't pass on any part of your machine as "good enough." Nothing is good enough in aeroplane construction but the very best.

Don't bolt your engine into place until you have made sure the machine is properly balanced. See that the weight of engine and operator are properly distributed. It is easy to shift the engine an inch or two before it is bolted down; but a big job afterward.

Don't place the radiator directly behind the operator; let it have all possible air. If the radiator boils over at the normal flying speed of your machine, get a larger one. Don't expect an aeroplane radiator to keep your engine cool on the ground or in a tent, unless installed in a monoplane with the full current from the propeller blowing on it.

Don't forget to replace paper packing, coated with shellac or thick oil, if you remove intake manifold or carbureter. The joints should be air-tight.

Don't try to run an engine with propeller attached without thrust bearings.

Don't place the gasoline tank on timbers of engine bed; the bottom of the tank should be at least twelve inches above the top of the carbureter or the flow of gasoline will be too slow when tank is half empty.

Don't waste your time, money and temper experimenting with poor propellers, make-shift radiators, or second-hand automobile engines.

Don't pull the propeller out of true in bolting it to the flange. Put a rule against the main frame of the plane and mark where the propeller tip lines up; then swing the propeller over and see that both ends touch the same mark. If they are not even the vibration may be terrific.

Some further "don'ts" which may be added are:

Don't let your magneto get covered with oil and grease; it may short some time, when you will be sorry.

Don't let oil collect on the surfaces of the plane. Put a drip pan under the engine. It will pay, as oil causes most coverings to deteriorate very fast.

Don't trust to the cut-out on the foot brake alone. Have another one, or better, two, handy, as your foot is likely to jar off when landing and the engine start up, possibly causing trouble.

Don't let a rip in the surface go. Patch it before it has a chance to spread.

The Ideal Aeroplane & Supply Co., 1200 Bedford avenue, Brooklyn, N. Y., have just issued their first catalogue of model supplies. The model supply business has grown to large proportions in this country. Thousands of school boys are building models with supplies obtained from such houses. The even work and finish of some of these model supplies are really extraordinary.

Robert E. Lee, Charlottesville, Va., has a biplane fitted with a 3-cylinder Elbridge engine, El Arco radiator, Unisparker, 10-gallon copper tank and direct connected 7-ft. diameter by 5-ft. pitch propeller and a spare one also, which he is willing to sell for less than the cost of the engine. The machine is designed something like a Farman. It is complete with tires and fittings. He reports a number of short flights last summer. The running gear is too light and needs to be rebuilt.

Antony Jannus, like "Grimy" White, has turned his rudder to literature, and "Success" will shortly have an article on the sensations of flying. No one yet has been able to give any intelligent description thereof, so the reading of this may be looked forward to with pleasure. Not only that, but he will, after a time, be flying a monoplane equipped with an Emerson engine.

J. A. McCallum of the Midwest Aviation Co., Kansas City, Mo., has been making frequent flights at Elm Ridge during the past few weeks. He uses two biplanes, one with a tractor screw working in front of the operator, the other equipped with usual type of propeller. The longest flights have been made with the latter machine. McCallum is making a series of exhibition flights in Kansas and Missouri. He uses an Elbridge "Featherweight" 1910 model engine, with El Arco radiator.

"Why is an aeroplane called 'She'?" was asked of G. S. Bennett, the secretary of the Kansas City Aviation School.

"I can guess several reasons," said Mr. Bennett. "One reason is that aeroplanes have wings and wings only grow on female angels. Another reason is because aeroplanes have extra ribs and more ribs than a man, and a 'She,' you know, has more ribs than a 'He.'

"Then every aeroplane has 'Stays' on them. Men don't wear stays or corsets in this country, so you see its furnishings are of the feminine type.

"All aeroplanes have to have a lot of cloth—high priced goods, too, to get them up in the world, and this is true of the 'She' sex.

"Men are needed to care for and manage all aeroplanes, as they are inclined to follow off some side fad that they meet up with in the air.

"But the main reason that aeroplanes are called 'She,'" said Mr. Bennett, "is the way they act. Uncertain, contrary and obstinate at a time when you expect so much from them. Everything may be most favorable—wind dies down, the motor runs smooth, a crowd out to see her go up—and she won't go up an inch 'just because.'"

The Burgess-built "Baby" Farmans, which were made for C. G. White, are getting plenty of flying at his school. Even passengers are being carried.

The firm of G. White, Bleriot and Maxim has not been able to get the £200,000 they tried to raise by selling stock. The money subscribed has been returned.

Farman is suing Grahame-White for infringement on the landing chassis on the 'Baby" and Bleriot is also suing him. Farman is also suing the Bristol people, whose machine is almost an exact copy.

UNITED STATES PATENTS ABSTRACTED

Copies of any of these patents may be obtained for 5 cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Johann Schutte, Langfuhr, Germany, 988,597, April 4, 1911. DIRIGIBLE having a plurality of spherical cells inside the casing.

Edwin Wilson, Lynn, Mass., assignor of one-half to Jacob Boyle, of Lynn, 988,611, April 4, 1911. Device for LAUNCHING an aeroplane by a spring.

Chas. M. Wanzer, Urbana, O., 988,681, April 4, 1911. PROPELLER with plurality of blades.

James Means, Boston, Mass., 989,022, April 11, 1911. OPERATING DEVICE for aeroplanes.

Patent covers a combination with independently operated lateral and longitudinal rudders, of a vertical rudder, a single manually operated means for simultaneously actuating said lateral and longitudinal rudders to correct disturbances of the lateral and of the longitudinal stability of said machine, and a controlling device for said vertical rudder mounted on said manually operated means or pendulum operated means, etc.

Florentin Barmettler, San Francisco, Cal., 989,319, April 11, 1911. DIRIGIBLE, with plurality of propellers in horizontal plane.

Jacob Phillips, Westfield, Pa., 989,412, April 11, 1911. HELICOPTER.

John Washington Wadsworth, Leetsdale, Pa., 989,455, April 11, 1911. DIRIGIBLE, heavier than air, air sucked in and discharged through ducts.

John J. Donnelly, Denver, Colo., 989,490, April 11, 1911. HELICOPTER.

Joseph A. Blondin, Los Angeles, Cal., 989,520, April 11, 1911. LANDING DEVICE, in which wheels are depressed into contact with ground when starting, tilting machine at a greater angle of incidence than in flight. In flight the wheels are raised for landing on skids.

Elmer E. Lessard, Heber, Ark., 989,616, April 18, 1911. Pivotally mounted engine operating ailerons for STABILITY.

Phineas S. Woods, Smithville, Mo., 989,681, April 18, 1911. Provides movable propeller shaft in a vertical plane, means for converting planes into parachutes.

Ulysses Grant Lee and William Austin Darrah, Brooklyn, N. Y., 989,786, April 18, 1911. Supporting surface of symmetrical, CONICAL SURFACES, concave downward, side by side, converging at front.

Joseph I. C. Clarke, New York, N. Y., 989,834, April 18, 1911. Apparatus employing a BLAST OF AIR under a surface, drawn downward from above by a blower.

Charles P. Savage and Jesse W. Silver, Tacoma, Wash., 990,011, April 18, 1911. Ailerons which are rotatable around a horizontal axis, in unison or separately, power driven, for STABILITY.

Josef Skorupa, Alpha, N. J., 990,015, April 18, 1911. Means for causing an aeroplane to rise vertically in starting a flight.

William Stemmer, Philadelphia, Pa., 990,404, April 25, 1911, filed Sept. 29, 1910. Aeroplane with PLURALITY OF PLANES.

Brantly Chalfant, Philadelphia, Pa., 990,424, April 25, 1911, filed Sept. 27, 1909. Dihedral SURFACE with wing extremities curved upwardly and steering device.

Fred G. and Albert E. Dieterich, Washington, D. C., 990,712, April 25, 1911, filed Jan. 13, 1911. AERO MOTOR in duplicate, or two distinct engine units, either of which can be run "live" or dead, as desired. Means for changing fuel supply from one to the other; one unit to be run at high speed and the other at a low speed.

Abel T. Newbury, Vermilion, Alberta, Canada, 990,897, May 2, 1911, filed Oct. 7, 1909. Combination airship, helicopter and aeroplane.

Geo. S. Udstad, Aurora, Ill., assignor of one-half to Charles Liet, Aurora, Ill., 991,115, May 2, 1911, filed Feb. 21, 1910. Combination of ROTATING BOX KITES, propellers and oscillating vertical surfaces mounted on a frame.

Edgar Murray Yates, Norman, Okla., 991,259, May 2, 1911, filed Dec. 27, 1909. DIRECT LIFT machine in which planes composed of pivoted slats maintain a horizontal position while rotated about an axis.

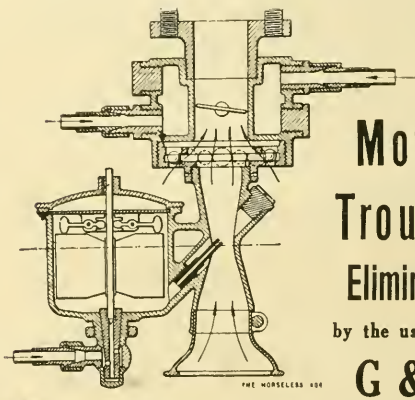
Sidney Lawrence, Micheldever, England, 991,331, May 2, 1911, filed Nov. 23, 1909. PROPELLER in which variations of shape, set or position of blades occur automatically under working conditions, in which blades possess, in part, rigidity, flexibility and resiliency.

Riley Estel Scott, 250 W. 54th St., New York, 991,378, May 2, 1911, filed May 4, 1910. MEANS for DROPPING PROJECTILES from aerial craft. Comprising a device and method enabling the operator to launch a projectile or bomb at such a time and in such a position that the target may be struck with accuracy. This device takes scientific consideration of speed, height, resistance of atmosphere, and other factors of such a problem and is the first device of its kind to have been patented.

John C. Schleicher, Mount Vernon, N. Y., 991,459, May 2, 1911, filed March 26, 1910. GAS ENVELOPE for airships.

Jack Lloyd Nichols, Belton, Tex., assignor of one-fourth to Albert Lee Jacks and one-eighth to Robert Lee Willis, both of Belton, Tex., 991,528, May 9, 1911, filed Oct. 26, 1909. Aeroplane with propellers below the planes, means for tilting the planes.

John Hughes, Baker, Mont., assignor of one-half to Helen Tracy, of Lake Andes, S. D., 991,620, May 9, 1911, filed May 14, 1910. AEROPLANE with superimposed planes; gears for driving the wheels of running gear.



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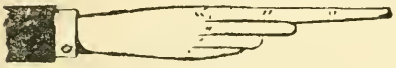

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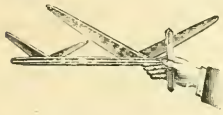

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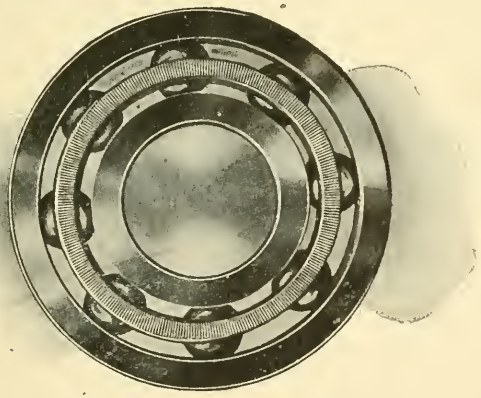

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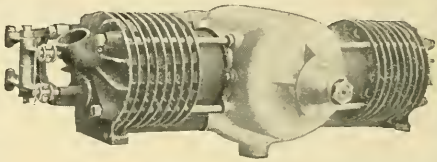

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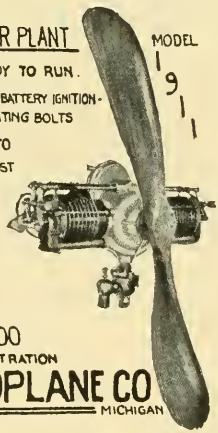

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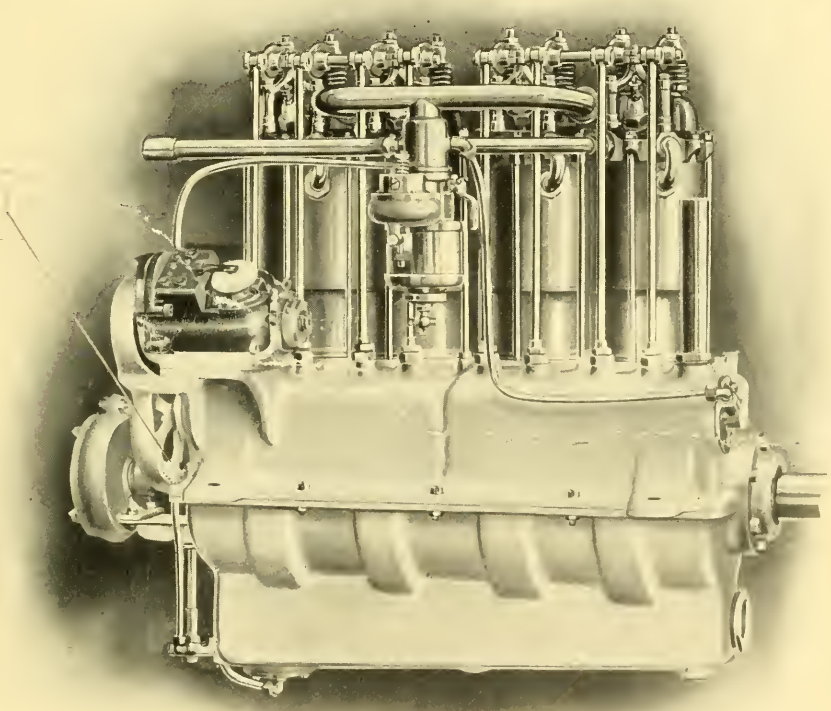

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